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THE FISHES OF NORT
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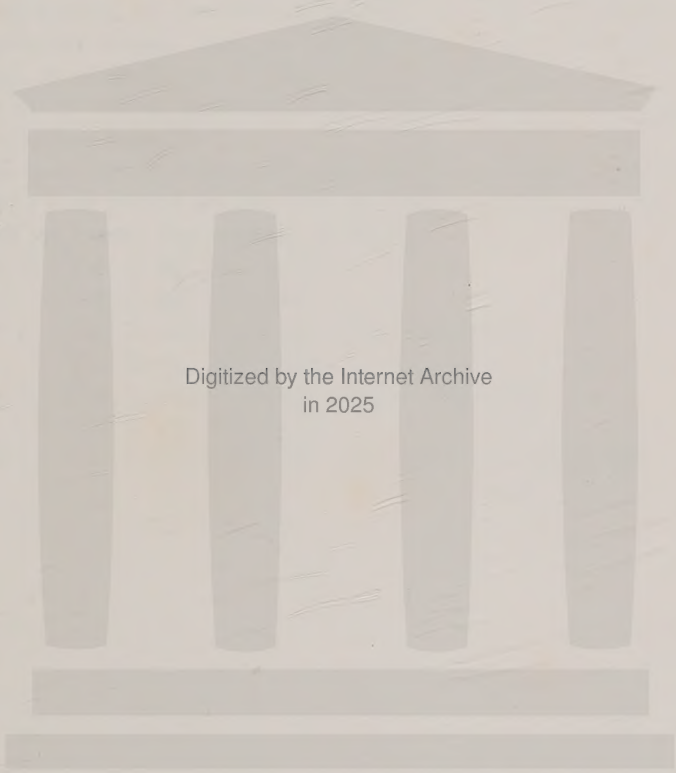
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THE FISHES OF NORTH AND MIDDLE AMERICA

by

David Starr Jordan

and

Barton Warren Evermann

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Page 1854. After *Scorpæna inermis* add:

2247(a). SCORPÆNA NEMATOPHTHALMUS (Günther).

Head 3 in total length; depth $3\frac{1}{2}$; eye 4 in head; snout rather less than 4. D. XII, 10; A. III, 5; scales 40 or 41. Dorsal outline much arched at greatest depth of body. Eye placed high, entering upper outline of head. Intermaxillaries styliform, armed, like the dentaries, with a rather narrow band of villiform teeth; band of vomerine teeth angularly bent, produced forward at the angle; maxillaries styliform at superior extremity, moderately dilated at the lower. Head scaled to posterior angle of orbit above and to the preorbital and angle of mouth laterally. Spines on head very prominent and acute in the young, more obtuse in older examples; 2 turbinal spines; on each side of the occiput a series of 5 spines between orbit and nape; 2 between eye and scapula; preorbital armed with 2 strong, recurved spines at the inferior margin; 3 spines on interorbital ridge; preopercular margin rounded, with 4 spines, the uppermost and strongest opposite end of interorbital ridge; opercle with 2 flat spines; a pair of spines at throat. The only skinny appendage is a long, slender, tapering filament above posterior angle of orbit. Origin of dorsal immediately behind vertical from suprascapula, its distance from occiput equaling length of first spine, which is about $\frac{1}{2}$ length of second; third and fourth spines longest, $2\frac{2}{3}$ in head; the following spines gradually decreasing to the eleventh, which equals the first; twelfth spine much longer, apparently belonging to the soft portion, which is supported by it; margin of soft portion rounded, very little higher than the spinous, posteriorly fixed to the back of the tail by a membrane; caudal subtruncated; origin of anal somewhat behind that of soft dorsal, its second spine strong, rather longer than the third dorsal, and with a longitudinal groove; pectoral reaching anal; ventral reaching vent. Scales of moderate size, rather irregularly arranged. Color probably uniform red. Supposed to be from the West Indies. (Günther.) Only the type known. (*νῆμα*, thread. *οφαλμός*, eye.)

Sebastes nematophthalmus, GÜNTHER, Cat., III, 99, 1860, West Indies; the exact locality unknown. (Coll. Sir R. Schomburgk.)

Page 1862. *Anoplopoma fimbria* is occasionally taken off Santa Catalina in deep water. A specimen was seen by us at Redondo Beach.

Page 1866, line 7 from bottom, read "always," not "usually."

Page 1867. In the key, *b* should read as follows:

b. Fourth line of pores forking in advance of base of ventrals, the lower branch running to base of ventral fin, the upper to middle of ventral. OCTOGRAMMUS, 2259.

In the footnote for "Keinosuke Otaki" read "Keinoske Otaki."

Page 1879, line 27, for "jointed" read "joined." Line 37, after "hypercoracoid" add "and hypocoracoid."

Page 1880. In the key read:

m. Lateral line armed with a series of bony plates; preopercular antler-like processes usually numerous.

Page 1881. The key should be modified to read:

q. Interorbital space deeply concave or grooved. Head with cirri (in *lateralis*), or without (in *asperulus*). ARTEDIUS, 712.

A better distinction between *Artedius* and *Axyrias* is found in the presence of patches of ctenoid scales on the head in the latter.

Page 1884. In line 19, for *Hexagrammidæ* read *Zaniolepidinæ*.

Page 1898. The type number of *Icelinus strabo* is 5045, not 5451.

Page 1902. *Artedius asperulus* is better separated from *A. lateralis* by the coalescence of the bands of scales behind the dorsal and their continuance upon the caudal peduncle. In the description of the genus *Artedius* the bands of scales are said not to meet behind the dorsal. This applies to *A. lateralis* only.

Page 1902. To the description of *Artedius* add: No patches of ctenoid scales on the head.

Page 1903. To the description of *Artedius asperulus* add: Head without cirri.

Page 1906. The type of *Artediellus atlanticus* is No. 448 L. S. Jr. Univ. Mus.

Page 1940. In the key, under *a*, add: Preopercular spine with 3 hooks above. Under *aa*, add: Preopercular spine with 6 or 7 hooks above.

Page 1958. *Cottus aleuticus* extends southward in the Coast Range to Monterey.

Page 1964. In key under *h* for "anal" read "axil."

Page 2000. After *Porocottus tentaculatus* add:

2371(a). POROCOTTTUS BRADFORDI, Rutter, new species.

Head 3; depth 3¾ to 4¼; eye 4. D. IX, 15* or 16; A. 11 to 13; P. 13 or 14; B. 6. Head broad, somewhat depressed; bones of head cavernous; lower jaw included, maxillary to below middle or hinder edge of pupil, 2⅓ in head; teeth in jaws and in a narrow crescent on vomer; eye equal to snout; nasal spines blunt, covered by the skin; no ocular, opercular, nor suprascapular spines; preopercular spines 3, upper slender, curved inward, lower straight, pointing downward, middle 1 short and blunt, a mere tubercle; a very slight tubercle represents the fourth spine belonging to the genus; no slit behind last gill; 3 pairs of cirri on top of head, 1 above eye, multifid, another at occiput, single or bifid, the other between them, trifid to multifid; a minute barbel on tip of maxillary; whole top and side of head, lower jaw, and edge of preopercle thickly covered with pores; a double series of pores, 34 to 36 each, along lateral line with many accessory pores, these arranged in groups of 1 to 5 between the pairs of the

	D.				A.		
Fin rays	IX, 15	IX, 16	IX, 17	VIII, 17	11	12	13
Number specimens	11	12	1	1	1	22	2

lateral line; nostrils with short tubes; dorsals united at base, the spines with short filaments, middle spines 3 in head, middle rays of soft dorsal $2\frac{1}{2}$ in head; caudal and ventrals $1\frac{2}{3}$ in head, ventrals usually reaching vent or anal, but sometimes falling short of each; pectoral $1\frac{1}{4}$ in head, reaching to or beyond anal. Color dusky, below colorless, a pale bar across occiput (often absent), another between dorsals, 2 across body under soft dorsal and another behind soft dorsal; sometimes the pale color predominates and the dusky portion is left as 4 bars; sometimes plain dusky without cross bars; spinous dorsal dusky with 3 or 4 colorless spaces on the web; other fins barred with series of dusky blotches, ventrals sometimes colorless; 5 to 8 oval white spots behind pectoral, sometimes obscure; males with inner ray or rays of ventral tuberculate or serrate. This species differs from *Porocottus sellaris* in the presence of cirri on top of head; it has more numerous fin rays and more cirri on head than *Porocottus quadrifilis*. This species is the most common fish in the rock pools at Karluk, where many specimens were taken. These are in the U. S. National Museum, in the collection of the U. S. Fish Commission, and in that of Leland Stanford Junior University. (Named for Mr. William B. Bradford, secretary of the Alaska Packers' Association, from whom the collector received many favors.)

Page 2015. Before *Oxycottus* insert the following:

745(a). SIGMISTES, Rutter, new genus.

Sigmistes, RUTTER, MS., new genus (*caulias*).

This genus differs from *Oxycottus*, to which it is most closely related, in the deep compressed body, strongly arched lateral line, long dorsal fin, and large mouth. Body deep and compressed; skin smooth; lateral line complete, strongly arched anteriorly; gill membranes united, free from isthmus; no slit behind last gill; preopercular spine simple, short, strongly curved upward, anal papilla large; vent immediately behind ventral fins, about $\frac{3}{8}$ of distance from gill membrane to anal; ventral rays I, 3. (*σίγμα*, the letter S, from the form of the lateral line.)

2382(a). SIGMISTES CAULIAS, Rutter, new species.

Head $3\frac{2}{7}$; depth $3\frac{1}{7}$. D. IX, 20 (IX, 21 in 1 specimen); A. 15 (14 in each of 2 specimens); P. 13. Back elevated, body compressed; eyes lateral, $4\frac{1}{8}$ in head; snout $3\frac{1}{2}$; cleft of mouth lateral; maxillary 2 in head, reaching to below pupil (only a little past front of eye in 1 specimen). Teeth coarse, cardiform, the inner row of upper jaw enlarged, almost caninelike; a similar pair in inner series of mandible, near symphysis; a small patch on vomer, and 1 on front of palatines; preopercular spine small, sharp, appressed, strongly curved upward, the preopercular margin without spines or tubercules below it; nostrils in short tubes, 1 pair directly behind nasal spines, 1 pair lateral, directly in front of eyes; nasal spines strong, sharp; a pair of tufted cirri above eyes, a pair simple or branched at occiput, and a pair of simple ones halfway between these; a filament on nasal spine, a series of 3 or 4 short ones on margin of preopercle and 1

at opercular angle; a series of pores around under side of jaw and along edge of preopercle, 2 concentric series under eye and across cheek, and others scattered on head behind eyes; skin smooth, lateral line strongly arched. Dorsal fins connected at base, third spine longest, 2¾ in head, margin of fin even from third to sixth spines, origin of spinous dorsal over upper edge of gill opening; soft dorsal higher, longest rays 2 in head, base of soft dorsal ⅔ length; tips of anal rays all free, longest 2⅓ in head; origin of anal under third ray of soft dorsal; longest pectoral ray a little longer than head; caudal truncate, 1½ in head; ventral about reaching anal, about same length as anal papilla; tail slender, least depth slightly less than eye, length from anal 1¼ in head, its length from dorsal about equal to its depth. Color in life, pale pinkish; spinous dorsal dusky, nearly black along margin; soft dorsal plain or with dusky cross bars; anal with about 7 dusky cross bars, extending downward and forward almost at right angles to the rays; 3 or 4 pale blotches surrounded by a black ring along base of dorsal, 1 between dorsals, 1 at end of soft dorsal, and others at base of soft dorsal (some or all sometimes absent); a curved dark line from snout through eye to preopercular spine. Six specimens, 1 each 2, 2½, and 3 inches long, and 3 1¼ inches long. From the rock pools at Karluk, on the Island of Kadiak. Coll. Cloudsley Rutter. The type is in Leland Stanford Junior University Museum. Cotypes are in the U. S. Fish Commission and U. S. National Museum. (*καύλος*, stem, from the many dorsal rays.)

Page 2015. In third line under *Oxycottus acuticeps* instead of "region" read "reaching."

Oxycottus is much nearer *Blennicottus* than *Oligocottus*, and perhaps is best placed as a subgenus of *Blennicottus*. There is no slit behind the last gill in any of the species. In the subgenus *Oxycottus* should be placed:

2383. **BLENNICOTTUS ACUTICEPS** (Gilbert).

2384. **BLENNICOTTUS EMBRYUM** (Jordan & Gilbert).

Page 2042. In line 9 for *Phalangistes* substitute *Brachyopsis*.

Page 2051. In first line of footnote, for "Dr. Gilbert" read "Scofield & Scale."

Page 2071. In line 14 of the description of *Acerruncus sterletus* read "upward," not "downward."

Page 2108. The synonymy on this page and the last synonym on page 2107 all belong with the footnote.

Page 2113. The type number of *Neoliparis greeni* is 3019, not 3010.

Page 2128. Before *Bathyphasma* insert the following:

785(a). **CRYSTALLICHTHYS**, Jordan & Gilbert, new genus.

Crystallichthys, JORDAN & GILBERT, new genus (*mirabilis*).

Closely allied to *Liparis*, but with nostril single. A single dorsal fin; a well-developed sucking disk; wide bands of teeth, many of which are trilobate near tip; an inferior mouth, much overhung by the produced

conical snout; a single nostril, corresponding to the anterior nostril of other Liparids, the posterior opening being wholly wanting. The typical species, *C. mirabilis*, differs from all known species of *Liparis* except *L. cyclostigma* in its large size, compressed form, and translucent gelatinous texture. (κρυστάλλος, crystal; ἰχθύς, fish.)

2458(a). CRYSTALLICHTHYS MIRABILIS, Jordan & Gilbert, new species.

Head 4 in length; depth $2\frac{1}{4}$; snout $2\frac{1}{7}$ in head; eye $3\frac{1}{2}$ in snout; width of mouth $\frac{1}{2}$ length of head; length of gill slit $\frac{1}{2}$ snout, equaling distance from front of eye to front of nostril tube; P. 33. Head and body compressed, especially along upper profile, which descends in a gentle, nearly even curve to tip of snout; lower profile less curved, nearly straight and horizontal on anterior third of body; snout conical, tapering to a sharp tip, its lower profile nearly horizontal, protruding beyond the mouth for a distance (measured axially) equaling $\frac{2}{3}$ its length; mandibular symphysis vertically below nostril tube; upper jaw strongly arched anteriorly, the mandible much shorter, nearly transverse in position. When the mouth is closed, there is exposed the entire width of the thick upper lip and the anterior portion of the band of fringes which precedes the premaxillary teeth. Teeth slender, shorter than in *Liparis cyclostigma*, arranged in about 25 oblique series in the $\frac{1}{2}$ of each jaw; the posterior longer teeth more or less distinctly 3-lobed in both jaws, the anterior teeth shorter, simple. A deep cleft on lower side of snout running from its tip to front of premaxillaries, deepening backward, opening into the deep groove above premaxillaries; from base of cleft arises a high free fold, the sharp edge of which nearly reaches the margins of the cleft; a series of 3 large pores along each side of this cleft, with 3 more equally spaced on each side and parallel with front of mouth; belonging to this series but distant from them and much smaller, is another on middle of cheek below eye, and 1 halfway between eye and middle of gill slit; a pore behind eye, and a series of 4 on each side of nape complete the pores of the head; no pore in the position of the posterior nasal opening; a second series of 6 on each side of mandible and preopercle; no other pores on head. Nostril single, in a distinct wide tube, as long as the diameter of pupil; distance from eye to angle of mouth $3\frac{1}{5}$ in head; vertical from angle of mouth, passing through front of orbit. Gill cleft narrow, reaching base of first pectoral ray, its length $4\frac{3}{5}$ in head. Lateral line rising in an abrupt curve from upper end of gill opening, decurved again behind pectorals, to reach middle of sides, on the posterior half of which it becomes obsolete; anteriorly the lateral line is accompanied above by a second series of pores which is not curved, but runs straight forward from just above the summit of the curve. Dorsal and anal fins enveloped anteriorly in thick gelatinous tissue, so that their points of origin and number of fin rays can not be determined, the fins high, the longest anal ray equaling length of snout and eye; 32 dorsal and 33 anal rays can be distinguished in the posterior transparent portions of the fins, the total number of rays being greater; last anal ray joining outer caudal ray at middle of length of the latter; dorsal joined narrowly to

base of caudal at end of basal seventh of outer caudal ray; longest caudal ray 2½ in head; lower 7 pectoral rays thickened, forming a lobe, the distal third of each ray free from the membrane; longest pectoral ray 1¼ in head; disk of moderate size, anteriorly placed, its posterior margin under the gill slit, its length ⅓ that of head. Color translucent, apparently light grayish or purplish in life, the dorsal region, including dorsal fin, marked with many large round spots, probably reddish in life, each spot surrounded with a faint darker ring. A large species, soft and gelatinous in texture, the color translucent grayish or purplish, marked on back with many large light circles which were probably reddish in life. Type, a specimen 330 mm. long, from *Albatross* Station 3643, off Provostmaya, Kamchatka, at a depth of 100 fathoms. Bering Sea; 1 specimen from Kamchatka, a smaller one dredged off St. Paul Island, Pribilof group. (***mirabilis***, wonderful.)

Crystallichthys mirabilis, JORDAN & GILBERT, Rept. Fur Seal Invest., MS., 1898, Provostmaya, Kamchatka. (Coll. *Albatross.*)

Page 2129. *Allurus* is preoccupied by *Allurus*, Forster, 1862, a genus of *Hymenoptera;* also by *Allurus*, Eisen, 1874, a genus of worms. We substitute for our use of it the name *Allinectes.*

Allinectes, JORDAN & EVERMANN, new subgenus (*ectenes*).

Page 2131, line 7, for "*Alldurus*" read "*Allurus.*" In lines 4 and 7, for "ἀλλός" read "ἄλλος."

Page 2137. After *Careproctus ectenes* add:

787(a). **PROGNURUS**, Jordan & Evermann, new genus.

Prognurus, JORDAN & EVERMANN, new genus (*cypselurus*).

This genus is distinguished from *Careproctus* by the very elongate caudal which is forked at the tip. (*πρόγνη*, a swallow or martin; *οὐρά*, tail.)

2469(a). **PROGNURUS CYPSELURUS**, Jordan & Gilbert, new species.

Head 4⅖ in length; depth 4$\frac{9}{10}$; cleft of mouth 1¾ in head, $\frac{5}{7}$ distance from symphysis of lower jaw to angle of mouth; total interorbital width 2½ in head; eye large, equaling length of snout, 3¾ in head; gill opening entirely above base of pectoral, not reaching base of upper ray, its length 3 in head; opercular lobe broadly rounded. Snout blunt, broadly rounded, the mouth horizontal along its lower margin, scarcely overlapped by it; upper lip wide. Teeth acute, without cusps, in about 27 oblique rows in 1 side of each jaw; maxillary reaching the vertical from posterior edge of the pupil; nostril opening in a wide, low tube. Front margin of ventral disk very slightly behind angle of mouth, its diameter ⅜ that of eye, about ⅛ length of head. Pectorals broadly rounded, regularly shortened below, not deeply notched, the lower 7 rays thickened and exserted; the longest free ray about ½ length of head; upper portion of fin with 26 rays, the tips only protruding, the longest equaling length of head; dorsal beginning shortly behind vertical from gill slit, its distance from tip of snout 3⅗ in length; dorsal with about 58 rays; caudal very long and narrow, only its basal third connate with last

rays of dorsal and anal. Unlike all other Liparids, the caudal is forked at tip, the terminal notch involving about $\frac{1}{7}$ of fin. Translucent dusky, darker around snout, gill openings, and on the fins, the vertical fins largely jet-black; mouth and gill cavity dusky, not black. This species is most nearly related to *Careproctus melanurus*, from which it differs in darker coloration and shorter gill slit. From all known species of *Careproctus* it differs in the very elongate caudal fin which is forked at the tip. Bering Sea and North Pacific. The type, a single specimen, 21 cm. long, dredged at *Albatross* Station 3644, off Bogoslof Island, at a depth of 664 fathoms. A second specimen was obtained by the *Albatross* in 1889, at Station 3074, off the coast of Washington, in 877 fathoms, but it was too seriously mutilated to admit of description. (*κυψελός*, a swift; *οὐρά*, tail.)

Page 2175. The genus *Chelidonichthys* should be compared with *Trigla* rather than with *Prionotus*.

Chelidonichthys pictipinnis is probably not American, and should be omitted or, at most, admitted only in a footnote.

The genus *Chelidonichthys* differs from *Trigla* in the absence of lateral plates.

Page 2183. To the synonymy of *Cephalacanthus* add:

Cephalacandia, RAFINESQUE, Anal. de la Nature 1815, 85; substitute for *Cephalacanthus*.

Page 2196, line 5, for "Pañeca" read "Puñeca."

Page 2207. *Sicya* being preoccupied in *Lepidoptera* we substitute for our use of it the name *Sicyosus*.

Sicyosus, JORDAN & EVERMANN, new subgenus (*gymnogaster*).

Page 2207. Add the following species:

2531(a). **SICYDIUM PUNCTATUM**, Perugia.

D. VI–I, 11; A. I, 10; scales 56. Head $5\frac{1}{4}$ in total length without caudal, its width equaling its height or $\frac{2}{3}$ that of body under first dorsal. Scales of body larger than those of head or nape; maxillary reaching posterior border of eye. Eye 4 in head, or $1\frac{1}{4}$ in interorbital space. Snout 4; pectoral equaling head in length; spines of first dorsal somewhat elongated, the longest (third) twice height of body; second dorsal as high as body and like the anal. Teeth of upper jaw fine, very slender, and ending behind in an obtuse angle; lower jaw with conic robust teeth and minute horizontal ones. Color grayish, the ventral gall color (giallognolo); under part of head with numerous small black spots; scales strongly ciliated and each with a brown spot in the center; dorsals brown; anal transparent, with a narrow black line; ventral disk yellowish. Length 8 cm. This species is not *S. plumieri* of Cuvier & Valenciennes, nor is it *S. antillarum*, Ogilvie-Grant, because of the difference in the number of scales, the different proportions and a different coloration. The type was collected by Captain Guiseppe Capurro at St. Pierre, Martinique. (Perugia.)

Sicydium punctatum, PERUGIA, Annali del Museo Civico di Storia Naturali di Genova, ser. 2, vol. XVI, 1896, 18, Martinique. (Coll. Capt. Guiseppe Capurro.)

Page 2226. *Gobius zebra* has 26 scales. Many fine specimens of this species, 3 to 4 inches long, from Clarion Island, are in the museum of Stanford University.

Page 2227. The type locality of *Gobius bosci* is Martinique.

Page 2230, second line, read "ÉMÉRAUDE" for "EMERANDE."

Page 2241. Insert the following synonymy after No. 2572:

Gobius lucretiæ, EIGENMANN & EIGENMANN, Proc. Cal. Ac. Sci., ser. 2, vol. I, Jan. 25, 1888, 57, Pearl Island, Gulf of Panama.

Page 2263. To the synonymy of *Gobioides* add:

Plecopodus, RAFINESQUE, Anal. de la Nature 1815, 87; substitute for *Gobioides*.

Page 2269. Omit the last reference but one.

Page 2314. To the synonymy of *Batrachoides* add:

Batrictius, RAFINESQUE, Anal. de la Nature 1815, 82; substitute for *Batrachoides*.

Page 2350. After *Enneanectes carminalis* insert:

868(a). DIALOMMUS, Gilbert.

Dialommus, GILBERT, Proc. U. S. Nat. Mus. 1890, 452 (*fuscus*).

Teeth conic, strong, in a narrow band in the front of both jaws, this narrowing to a single series laterally; outer teeth enlarged in both jaws. Teeth on vomer in a single series; palatines smooth. A single slender tentacle above orbits, and 1 on each side of nape. Body with moderate cycloid scales; lateral line high in front, declining behind pectoral fins, not strongly developed, evident on a few scales near head, the remainder of its course traceable by occasional pores on bases of scales or by their notched margins. Dorsal beginning on the nape, its anterior $\frac{4}{7}$ composed of slender flexible spines, the remainder of soft rays, unbranched; anal without spines; caudal distinct, rounded; ventrals well developed, I, 3. Eyes as in *Anableps*, the cornea divided by an oblique pigmented band into an anterior lower and a posterior upper half. One species known. (*διά γύω*, to loose one from another, to part asunder; *ὄμμα*, eye.)

2687(a). DIALOMMUS FUSCUS, Gilbert.

Head 5 in length; depth 6 to 7. D. XXV, 13 or 14; A. I, 28; lateral line, 52. Elongate, slender, scarcely tapering. Head short, transversely evenly rounded, with very short, blunt, decurved snout; width of head greater than its depth, and more than $\frac{2}{3}$ its length. Mouth horizontal at lower outline of snout, the maxillary nearly reaching vertical from posterior margin of orbit, $2\frac{2}{3}$ in head. Teeth strong, conical, the outer series enlarged in both jaws, a narrow band of villiform teeth behind the outer series; vomer with a single series; palatines toothless. Eyes large, round, closely approximated, their diameter greater than length of snout, twice the width of interorbital space, $3\frac{1}{3}$ in head. Gill membranes very widely joined, free from isthmus. No hook on inner edge of shoulder girdle. Dorsal fin beginning on the nape, over front of opercle, its spines slender and flexible, much lower than soft rays; height of anterior and middle spines about equal, $\frac{1}{3}$ length of head; the posterior spines shortened, about $\frac{1}{2}$ that length; height of soft rays $\frac{1}{2}$ head; first anal ray short and spinous, the succeeding rays articulated, but not branched (like those of dorsal). Interradial membranes of anal fin very deeply incised; caudal

fin wholly free, rounded, its length nearly equaling that of head; pectorals slightly shorter than head, posteriorly pointed, the longest rays below the middle of fin; ventrals comparatively broad, inserted but little in front of pectorals, their bases separated by a space equal to ½ diameter of orbit. Color in spirits, brownish above and on sides, becoming blackish on head; under side of head, belly, and a line along each side of anal fin light; back with traces of about 10 black cross bars, which invade base of dorsal fin and extend onto middle of sides; in 1 specimen the scales of the interspaces are marked each with a light spot (probably blue in life); fins all dusky, the caudal variegated with lighter in fine pattern; ventrals light at base. Two specimens from the Galapagos Islands—1 from Duncan Island, 72 mm. long, the other from Albemarle Island, 75 mm. long.

Dialommus fuscus, GILBERT, Proc. U. S. Nat. Mus. 1890, 452, Galapagos Islands. (Coll. *Albatross*.)

Page 2352. *Gibbonsia evides* intergrades with *Gibbonsia elegans* and must apparently be regarded as a subspecies of the latter.

Page 2356. Under *Malacoctenus ocellatus* for "A. II, 8" read "A. II, 18."

Page 2413. Genus 904 should read *Ulvicola*, Gilbert, not "Gilbert & Starks."

Page 2421. *Anoplarchus alectrolophus* is the type of a new genus:

908(a). ALECTRIAS, Jordan & Evermann.

Alectrias, JORDAN & EVERMANN, new genus (*alectrolophus*).

This genus is distinguished from *Anoplarchus* by having the gill membranes free from the isthmus, as in *Cebedichthys*. (ἀλέκτωρ, a cock; from the crest.)

Page 2422, under *Anoplarchus alectrolophus:* The 2 specimens obtained in Monterey Bay by Arthur W. Greeley were erroneously referred to this species. They are the young of *Cebedichthys*.

Page 2470. To synonymy of *Lycenchelys* add:

Lycodophis, VAILLANT, Exp. Sci. Trav. et Talisman, 311, 1888 (*albus*).

Page 2472. *Furcella* is preoccupied by *Furcella*, Lamarck, 1801, a genus of Mollusca. We substitute for our use of it the name *Furcimanus*.

Furcimanus, JORDAN & EVERMANN, new genus (*diapterus*).

Page 2473. In lines 33, 36, and 37 read "in 282 to 376 fathoms" instead of the depths given.

Page 2475. In lines 26 and 28, for "coast of Alaska" read "coast of California."

Page 2480. The locality for *Melanostigma pammelas* is coast of California, not Alaska.

Page 2567. In first line of footnote read "fin," not "spine."

Page 2601, line 20, for "*Trachyterus*" read "*Trachypterus*."

Page 494. The large "Silver Trout" of Lake Tahoe, a specimen of which is described on page 494, should probably be separated subspecific-

ally from its parent form, *Salmo clarkii henshawi*. It may be described as follows:

780(d). **SALMO CLARKII TAHOENSIS,** Jordan & Evermann, new subspecies.

(Silver Trout of Lake Tahoe.)

Head $4\frac{1}{16}$; depth $3\frac{4}{5}$; eye $7\frac{3}{8}$ in head. D. 9; A. 12; Br. 10; scales 33-205-40; 140 pores. Pectoral $1\frac{3}{8}$ in head; maxillary $1\frac{3}{8}$. Body very robust, compressed, unusually deep for a trout, the outline elliptical. Head large, rather more compressed than in typical *Salmo clarkii henshawi*; eye small, silvery. Vomerine teeth in 2 long series, those of the 2 series alternating in position; hyoid teeth distinct, in a rather long series; gill rakers short, thickish, 5 + 13. Mouth large, the maxillary extending well beyond the eye. Preopercle moderate, its lower posterior edge not evenly rounded, but with a slightly projecting, rounded lobe and a slight concavity above and below, this character not strongly marked; opercle evenly, but not strongly, rounded. Scales small, reduced above and below, those in or near lateral line largest. Fins moderate, the anal rather high, with 1 more ray than usual; caudal slightly lunate, almost truncate when spread open. Color dark green above, belly silvery; sides with a broad coppery shade covering cheeks and opercles; sides of lower jaw yellowish; fins olivaceous, a little reddish below; orange dashes between rami of lower jaw moderately conspicuous; back, from tip of snout to tail, closely covered with large, unequal black spots; spots on top of head and nape round; posteriorly the spots run together, forming variously shaped markings, usually vertically oblong; these may be regarded as formed of 3 or 4 spots placed in a series, or with 1 or 2 at the side of the other; the longest of the oblong markings not quite as long as eye; along side of head and body the spots are very sparse, those on head round, those behind vertically oblong; belly profusely covered with small black spots which are nearly round; still smaller round spots numerous on lower jaw; all the spots on caudal peduncle vertically oblong or curved; dorsal and caudal densely covered with oblong spots, smaller than those on the body; anal with rather numerous round spots; pectorals and ventrals with a few small spots, the first ray in each case with a series of faint small spots; adipose fin spotted. The above description from a specimen 2 feet 4 inches long and weighing $7\frac{1}{2}$ pounds. This form attains a weight of 10 to 30 pounds and spawns only in the depths of the lake. *Salmo clarkii henshawi* reaches a much smaller size, is much darker in color, and spawns in the streams. Thus far known only from the deep waters of Lake Tahoe. (*tahoensis*, from Lake Tahoe.)

Salmo clarkii tahoensis, Jordan & Evermann, new subspecies, Lake Tahoe. (Coll. A. J. Bayley.)

Page 518. It is wholly uncertain where Valenciennes got the specimen which he called *Thymallus ontariensis*. It is probably the ordinary Grayling (*Thymallus thymallus*) of Europe, erroneously attributed to Milbert's New York collection. In any case, its identity with the Michigan Grayling is more than doubtful, as the rivers in which the latter occurs were then unexplored. The American Graylings would therefore stand as follows:

787. **THYMALLUS SIGNIFER** (Richardson).

(Arctic Grayling; Poisson Bleu.)

788. **THYMALLUS TRICOLOR,** Cope.

(Michigan Grayling.)

788(a). **THYMALLUS TRICOLOR MONTANUS** (Milner).

(Montana Grayling.)

To the synonymy of the Montana Grayling add the following wholly unnecessary synonym:

Thymallus lewisi, Henshall, Forest and Stream, July 23, 1898, 70, headwaters Jefferson River, Red Rock Lake, Montana; after notes of Lewis & Clark.

Dr. J. C. Merrill, U. S. A., informs us that this Grayling is found also in Sun River at Fort Shaw, Montana.

Page 852. The species called *Holocentrus marianus*, Cuvier & Valenciennes, is the type of a distinct genus:

382 (a). **FLAMMEO**, Jordan & Evermann, new genus.

Flammeo, Jordan & Evermann, new genus (*marianus*).

This genus is distinguished by the very large mouth and projecting chin. The lower jaw is considerably more than ½ the length of the head, and the chin projects beyond the upper jaw. In the species properly referable to *Holocentrus*, the lower jaw is slightly included and its length is less than ½ the head. The single known species of this genus is

1238. **FLAMMEO MARIANUS** (Cuvier & Valenciennes).

Page 858. In line 13 the interorbital space in *Upeneus* is said to be "concave;" this should, of course, read "convex."

Page 2013. *Oligocottus maculosus*, Girard, was evidently based on a specimen from the Farallones of the species called by us *Oligocottus borealis*, Jordan & Snyder. The name *maculosus* must therefore be transferred to the latter species. The species called by us *Oligocottus maculosus* must therefore be renamed and may stand as

2381. **OLIGOCOTTUS SNYDERI**, Greeley, new species.

Oligocottus snyderi, Greeley, MS. 1898.

Page 2126, lines 13 and 14. The specimens from St. Paul Island and Petropaulski, referred by us to *Liparis cyclostigma*, Gilbert, belong to *Crystallichthys mirabilis*, Jordan & Gilbert, described on page 2865.

Page 2626. Before *Paralichthys æstuarius*, Gilbert & Scofield, insert:

2991(a). **PARALICHTHYS MAGDALENÆ**, Abbott, new species.

Head $3\frac{5}{6}$; depth $2\frac{1}{3}$. D. 80; A. 64; scales 120. Body oval-elliptical, the dorsal outline evenly bowed, the greatest depth in the middle of the body.

Ventral outline straighter anteriorly. Mouth large; mandible somewhat projecting, about 1¼ in head; maxillary large, extending considerably beyond orbit; snout (measuring from upper orbit) about 4 in head, ⅔ length of eye; interorbital about 9½ in head; eye 6 in head. Teeth moderately strong, the anterior ones in the lower jaw somewhat larger than the others; gill rakers 7 + 17, slender, weakly serrate, the longest a trifle less than eye. Scales cycloid, on cheeks, opercles and maxillary; snout, interorbital, and mandible naked; accessory scales present, especially prominent among the small crowded scales in the region below the pectoral; arch of lateral line 3½ in straight part; pores about 38 + 82. Ventral 3½ in head; pectoral 2; dorsal beginning above anterior rim of orbit; middle rays of anal and dorsal longest, 2½ in head, equaling width of caudal peduncle; caudal double lunate, the middle rays the longest; pectoral of blind side rounded, 2½ in head. Color dark reddish brown, closely peppered with darker dots; a series of indistinct white spots, 4 or 5 in number, following margins of the body, as in *P. californicus;* traces of darker mottling along sides of body. Length 17 inches.

This species, represented by a specimen from Magdelena Bay, Lower California, is closely related to *P. californicus,* resembling it in the large number and close arrangement of the gill rakers, but differing from it in having cycloid scales, a greater number of fin rays, somewhat narrower interorbital, and greater depth in proportion to the length.

Paralichthys magdalenæ, ABBOTT MS., new species, Magdalena Bay, Lower California. (Type, No. 10196, L. S. Jr. Univ. Mus. Coll. Charles H. Gilbert.)

Page 2627. Instead of *Paralichthys adspersus* (Steindachner), read :

2994. PARALICHTHYS SINALOÆ, Jordan & Abbott, new species.

The specimens described in the text (from Mazatlan and La Paz), under the name *Paralichthys adspersus,* belong to a distinct species, thus far known only from the west coast of Mexico and Central America and which may be called *Paralichthys sinaloæ,* one of the many specimens taken by the Hopkins Expedition at Mazatlan and La Paz being taken as type, and the following as cotypes: Nos. 11726, 11727, 11728, 11729, 11730, 11731, L. S. Jr. Univ. Mus., all from Mazatlan. *Paralichthys adspersus* is known only from the coast of Peru, the specimens before us being from Callao. (Coll. Admiral L. A. Beardslee.)

Paralichthys sinaloæ is distinguished from *P. adspersus* by its cycloid scales and broader interorbital space. The gill rakers in *P. adspersus* are close-set, rather long and slender, about ¾ to ⅘ of eye, and with rather slender spinules on the inner margin. In *P. sinaloæ* they are set farther apart on the limb of the gill arch, are shorter and thicker—about 2 in eye—and have the inner edge armed with coarser teeth. All specimens of *P. sinaloæ* have each 14 or 13 gill rakers on the lower limb of the arch, while in 4 examples of *P. adspersus,* from Callao, there are 16 or 17 gill rakers on the lower limb (19 in 1 specimen), and 7 or 6 above (5 in 1 specimen), showing that while there may be variation in the number yet it is confined within limits which do not intergrade and the average number

in the 2 species is quite different. In the single known specimen of *P. woolmani* the number of gill rakers given is 5 + 11, which makes it probable that the present species is not the same. The more striking difference between *P. adspersus* and *P. sinaloæ* lies in the scales, which in the latter are cycloid, while in the true *P. adspersus* they are strongly toothed as stated by Steindachner. The specimens from Callao referred by us in the text to *adspersus* belong to that species, but they are not original types of *adspersus*, belonging to the later collections of Agassiz and Steindachner.

Paralichthys sinaloæ, JORDAN & ABBOTT MS., new species, Mazatlan, Sinaloa, Mexico. (Type, No. 2930, L. S. Jr. Univ. Mus. Coll. Hopkins Exped. to Mazatlan.)

Page 686. After *Platypœcilus maculatus* add:

1009(a). PLATYPŒCILUS QUITZEOENSIS, B. A. Bean.

Head 3½; depth 2⅔; eye 3¼ in head; snout 4; interorbital width 2⅔. D. 13; A. 13; scales 30, 10. Body compressed, back elevated, head small and depressed, flat on top; snout short. Mouth small, cleft oblique, the lower jaw heavy, projecting; teeth conic, those in upper jaw in an irregular series, those below very small, apparently irregularly arranged and close-set. Origin of dorsal fin in advance of that of anal, midway between tip of upper jaw and end of caudal rays, the first ray of anal being under sixth dorsal ray. Color in alcohol light brown, with traces of darker on back; interorbital space and edge of scales dark brown; 3 dark bars on posterior part of body, the first extending from median line to origin of anal, the second from median line to end of anal base, the third midway between end of anal and origin of caudal; 2 dark spots on end of caudal peduncle; fins all pale. Lake Quitzeo, Michoacan, Mexico. Only the type known.

Platypœcilus quitzeoensis, B. A. BEAN, Proc. U. S. Nat. Mus. 1898, 540, with text figure, Lake Quitzeo, Michoacan, Mexico. (Type, No. 48209. Coll. E. W. Nelson.)

ARTIFICIAL KEY TO THE FAMILIES OF THE TRUE FISHES OR TELEOSTEI.

The following key is intended simply to facilitate the identification of species of the true fishes. No attempt is made to indicate the natural characters or relations of the families, and only those species of any group which are included in the present work are taken into consideration. Most of the ordinary fishes can be readily placed by its means, but it should not be trusted in the study of ichthyological rarities, or of fishes from the deep seas.

I.—VENTRAL FINS PRESENT, ABDOMINAL.

A. Back with an adipose fin behind the single rayed dorsal fin.
B. Adipose fin composed of a single spine with a thin membrane; body mailed.....XXXV, LORICARIIDÆ, 155.
BB. Adipose fin without spine.
C. Head with 4 to 8 long barbels about the mouth and nostrils; body scaleless; a single spine in each pectoral and in dorsal fin.....XXXIV, SILURIDÆ, 115.
CC. Head without barbels as described above.
D. Sides of body without photophores or luminous glands; no barbel at throat.
E. Body scaleless; teeth very strong, some of them fang-like.
F. Dorsal fin very long and high, occupying nearly whole length of back.....LXXXI, ALEPISAURIDÆ, 593.
FF. Dorsal fin short, median or posterior.
LXXXII, ODONTOSTOMATIDÆ, 597.
EE. Body scaly.
G. Pseudobranchiæ present.
H. Dorsal, anal, and ventrals each with a small but distinct spine; scales ctenoid.....CIV, PERCOPSIDÆ, 783.
HH. Dorsal, anal and ventral without distinct spine.
I. Head naked.
J. Branchiostegals 6 to 20.
K. Dorsal fin long and high, of about 24 rays.
LXV, THYMALLIDÆ, 517.
KK. Dorsal fin moderate, of fewer than 20 rays.
L. Stomach with many pyloric cæca.
LXIV, SALMONIDÆ, 460.
LL. Stomach with few pyloric cæca; size small.
LXVI, ARGENTINIDÆ, 519.
JJ. Branchiostegals 3 or 4; mouth very small.
LXVII, MICROSTOMATIDÆ, 527.
II. Head scaly on sides.
M. Maxillary very narrow, rudimentary, or obsolete; hypocoracoids not divergent.....LXVIII, SYNODONTIDÆ, 532.
MM. Maxillary well developed, dilated behind; pectorals normal; hypocoracoids mostly divergent. LXIX, AULOPODIDÆ, 541.
GG. Pseudobranchiæ absent.
N. Pectorals normally formed, teeth incisor-like or else rudimentary; pseudobranchiæ absent.....XXXIX, CHARACINIDÆ, 331.

NN. Pectorals not normally formed.
O. Pectorals undivided, subhumeral; pseudobranchiæ absent.
LXX, BENTHOSAURIDÆ, 543.
OO. Pectoral rays elongate, arranged in two groups.
LXXI, BATHYPTEROIDIDÆ, 544.
DD. Sides of body with photophores more or less developed.
P. Barbel at throat present, very long; body naked.
LXXVIII, ASTRONESTHIDÆ, 586.
PP. Barbels none.
Q. Vertebral spines projecting through skin of back before dorsal fin; body short and deep, greatly compressed.
LXXXIV, STERNOPTYCHIDÆ, 603.
QQ. Vertebral spines not exserted in front of dorsal.
R. Pseudobranchiæ present.
S. Premaxillaries forming entire margin of upper jaw; body scaly; opercles complete.
T. Form elongate, the snout pointed, barracuda-like; photophores very small.....LXXXIII, PARALEPIDIDÆ, 599.
TT. Form oblong, the snout not much produced; photophores conspicuous.....LXXV, MYCTOPHIDÆ, 550.
SS. Premaxillaries not forming the whole margin of upper jaw, the maxillary entering into it; body naked; opercular apparatus incomplete.....LXXVI, MAUROLOCIDÆ, 576.
RR. Pseudobranchiæ absent; mouth large, with canine teeth; scales deciduous or wanting...LXXVII, CHAULIODONTIDÆ, 578.
AA. Back without adipose fin.
B. Back with a single dorsal fin made up of rays and not preceded by a series of free spines or followed by finlets.
C. Tail evidently strongly heterocercal.
D. Body naked; snout with a spatulate blade; mouth wide, without barbels .....XXX, POLYODONTIDÆ, 101.
DD. Body with 5 series of body shields; mouth, inferior, toothless, preceded by 4 barbels .....XXXI, ACIPENSERIDÆ, 102.
DDD. Body scaly.
E. Scales cycloid; a broad bony gular plate; dorsal fin many rayed.
XXXIII, AMIIDÆ, 112.
EE. Scales ganoid; no gular plate; dorsal fin short.
XXXII, LEPISOSTEIDÆ, 108.
CC. Tail not evidently hetorocercal.
F. Tail tapering to a point, without caudal fin; anal fin very long, of about 200 rays; body scaly.
LXXXVI, HALOSAURIDÆ, 606.
FF. Tail not tapering to a point; caudal fin developed.
G. Body naked.
H. Throat with a long barbel; no caudal filament; mouth large.
I. Barbel free at tip .....LXXIX, STOMIIDÆ, 587.
II. Barbel connecting throat with symphysis of lower jaw.
LXXX, MALACOSTEIDÆ, 592.
HH. Throat without barbel.
J. Caudal fin with a long filament; body elongate; mouth very small .....CI, FISTULARIIDÆ, 755.
JJ. Caudal fin without filament.
K. Pectorals present.
L. Gill membranes joined to the isthmus; opercles complete.
XXXVII, CYPRINIDÆ, 199.
LL. Gill membranes free from isthmus; opercles incomplete.
LXXIII, RONDELETIIDÆ, 547.
KK. Pectorals wanting; body snake-like; dorsal long and low.
LXXXV, IDIACANTHIDÆ, 604.
GG. Body scaly.

M. Head with a large divided luminous plate in place of eyes.
LXXII, IPNOPIDÆ, 546.
MM. Head with eyes concealed beneath the skin; vent at the throat.
XCIII, AMBLYOPSIDÆ, 702.
MMM. Head with normally developed eyes.
N. Body with a coat of mail; maxillary with barbels.
XXXV, LORICARIIDÆ, 155.
NN. Body with ordinary scales.
O. Anal fin with many spines; mouth toothless, sucker-like.
LXXXVIII, LIPOGENYIDÆ, 619.
OO. Anal fin without distinct spines.
P. Pectoral fins inserted high, near axis of body; lower pharyngeals united; lateral line along sides of belly.
Q. Jaws each with long sharp teeth mixed with smaller ones.
XCIV, ESOCIDÆ, 708.
QQ. Jaws with small equal teeth, conic or tricuspid.
R. Lower jaw more or less produced; teeth tricuspid.
XCV, HEMIRAMPHIDÆ, 718.
RR. Lower jaw a little produced; teeth conic; pectorals elongate, forming an organ of flight.....XCVII, EXOCŒTIDÆ, 726.
PP. Pectoral fins inserted below axis of body; lower pharyngeals separate.
S. Gill membranes broadly joined to the isthmus; head naked; no teeth in jaws.
T. Lower pharyngeal teeth very numerous, in 1 row like the teeth of a comb. (Suckers.).....XXXVI, CATOSTOMIDÆ, 161.
TT. Lower pharyngeal teeth few, fewer than 8, in 1 to 3 rows. (Carp; Chubs; Minnows.).....XXXVII, CYPRINIDÆ, 199.
SS. Gill membranes free from the isthmus.
U. Throat with a long barbel; sides with phosphorescent spots.
LXXIX, STOMIATIDÆ, 587.
UU. Throat without barbels.
V. Phosphorescent spots present; teeth unequal.
LXXVII, CHAULIODONTIDÆ, 578.
VV. Phosphorescent spots none.
W. Head scaly, more or less.
X. Maxillaries connate with premaxillaries; jaws long.
LXVII, SYNODONTIDÆ, 532.
XX. Maxillaries distinct.
Y. Upper jaw not protractile, its lateral margins formed by the maxillaries; lateral line more or less developed.
Z. Teeth cardiform; jaws depressed, prolonged.XCI, LUCIIDÆ, 624.
ZZ. Teeth villiform; jaws short; no lateral line.
a. Pectoral very broad, of about 35 rays..LXXXIX, DALLIIDÆ, 620.
aa. Pectoral narrow, of about 13 rays.....XC, UMBRIDÆ, 622.
YY. Upper jaw protractile, its margin formed by premaxillaries alone; no lateral line.....XCII, PŒCILIIDÆ, 630.
WW. Head naked.
a. Anterior vertebræ coalesced and modified; no pseudobranchiæ; jaws with strong canines..XXXVIII, ERYTHRINIDÆ, 330.
aa. Anterior vertebræ normal, not modified.
b. Dorsal fin inserted more or less before anal (rarely slightly behind it); shore fishes or river fishes, usually silvery in coloration and with skeleton firm; air bladder well developed.
c. Gular plate present, between branches of lower jaw; mouth large; teeth present, all pointed; axillary scales and sheaths large.....LVI, ELOPIDÆ, 408.
cc. Gular plate none.
d. Lateral line well developed.
e. Teeth present, no accessory branchial organ.

f. Mouth small, horizontal; posterior part of tongue and roof of mouth covered with coarse-paved teeth.
LVII, ALBULIDÆ, 410.
ff. Mouth large, the teeth all pointed, some of them canine, none paved or molar.....LVIII, HIODONTIDÆ, 412.
ee. Teeth none; an accessory branchial organ behind gill cavity.
LIX, CHANIDÆ, 414.
dd. Lateral line wanting; no gular plate.
g. Mouth small, inferior, toothless, the maxillary simple or nearly so; stomach gizzard-like.....LX, DOROSOMATIDÆ, 415.
gg. Mouth moderate, terminal, the maxillary of about 3 pieces; stomach not gizzard-like.....LXI, CLUPEIDÆ, 417.
ggg. Mouth subinferior, very large, below a tapering, pig-like snout; maxillary very long.....LXII, ENGRAULIDIDÆ, 439.
bb. Dorsal fin posterior, opposite anal; deep-sea fishes, of loose organization; mostly blackish in color; mouth small, with small pointed teeth; air bladder wanting.
LXIII, ALEPOCEPHALIDÆ, 451.
BB. Dorsal fin single, preceded by free spines.
h. Body scaleless, naked or with bony plates.
i. Ventral fins I, 1, the spine strong; snout moderate.
XCVIII, GASTEROSTEIDÆ, 742.
ii. Ventral fins, I, 5, the spine slender; snout prolonged.
XCIX, AULORHYNCHIDÆ, 752.
hh. Body scaly; snout tubular.....C, AULOSTOMIDÆ, 754.
BBB. Dorsal fin composed of free spines; ventrals with 1 or 2 spines each; body elongate.....LXXXVII, NOTACANTHIDÆ, 613.
BBBB. Dorsal fins 2, the anterior of spines only, the posterior chiefly of soft rays.
j. Pectoral fin with 5 to 8 lowermost rays detached and filamentous.....CIX, POLYNEMIDÆ, 827.
jj. Pectoral fin entire.
k. Snout tubular, bearing the short jaws at the end; body compressed.....CII, MACRORHAMPHOSIDÆ, 758.
kk. Snout not tubular.
l. Teeth strong, unequal; lateral line present.
CVIII, SPHYRÆNIDÆ, 822.
ll. Teeth small or wanting; lateral line obsolete.
m. Dorsal spines 4, stout; anal spines 3.....CVII, MUGILIDÆ, 808.
mm. Dorsal spines 4 to 8, slender; anal spine single.
CVI, ATHERINIDÆ, 788.
BBBBB. Dorsal fin soft-rayed, followed by a series of detached finlets.
XCVI, SCOMBRESOCIDÆ, 724.

II.—VENTRAL FINS PRESENT, THORACIC OR SUBJUGULAR, THE NUMBER OF RAYS DEFINITELY I, 5.

A. Gill openings in front of the pectoral fins.
B. Body more or less scaly or armed with bony plates.
C. Ventral fins completely united; gill membranes joined to the isthmus; no lateral line.....CLXXXVIII, GOBIIDÆ, 2188.
CC. Ventral fins separate.
D. Suborbital with a bony stay, which extends across the cheek to or toward the preopercle; cheeks sometimes entirely mailed.
E. Pectoral fin with 3 lower rays detached and free; head bony.
CLXXXIV, TRIGLIDÆ, 2147.
EE. Pectoral fin with 2 lower rays detached and free; body mailed.
CLXXXV, PERISTEDIIDÆ, 2177.
EEE. Pectoral fin entire.
F. Slit behind fourth gill small or wanting.

G. Dorsal spines 4; lips fringed; eyes superior.
CXCVII, URANOSCOPIDÆ, 2305.
GG. Dorsal spines 8 to 17.
H. Anal spines 3; body scaly.....CLXXVI, SCORPÆNIDÆ, 1758.
HH. Anal spines obsolete; body partly or wholly naked.
CLXXIX, COTTIDÆ, 1879.
FF. Slit behind fourth gill large; body scaled.
I. Nostril single on each side, a small pore above it; dorsal fin continuous.....CLXXVIII, HEXAGRAMMIDÆ, 1863.
II. Nostrils 2 on each side; dorsal fins 2, separate, except in the genus *Erilepis* .....CLXXVII, ANOPLOPOMATIDÆ, 1861.
DD. Suborbital stay wanting; cheeks not mailed.
J. Spinous dorsal transformed into a sucking disk on top of head, composed of 8 to 30 transverse plates.
CLXXXIX, ECHENEIDIDÆ, 2265.
JJ. Spinous dorsal (if present) not transformed into a sucking disk.
K. Dorsal spines all or nearly all disconnected from each other.
L. Body elongate, spindle-shaped..CXXVII, RACHYCENTRIDÆ, 947.
LL. Body oblong or ovate, compressed.
M. Caudal peduncle very slender, the fin widely forked; preopercle entire.....CXXV, CARANGIDÆ, 895.
MM. Caudal peduncle stoutish, the fin little forked.
N. Gill membranes free from the isthmus; preopercle serrulate.
CXXXIV, CENTROLOPHIDÆ, 962.
NN. Gill membranes broadly united to the isthmus; preopercle entire.
CLXIV, EPHIPPIDÆ, 1666.
KK. Dorsal spines (if present) all, or most of them, connected by membrane.
O. Pectoral fin with 4 to 9 lowermost rays detached and filiform.
CIX, POLYNEMIDÆ, 827.
OO. Pectoral fin entire.
P. Dorsal and anal each with 1 or more detached finlets.
Q. Anal preceded by 2 free spines.....CXXV, CARANGIDÆ, 895.
QQ. Anal not preceded by 2 free spines.
R. Caudal peduncle keeled.....CXVIII, SCOMBRIDÆ, 863.
RR. Caudal peduncle not keeled.....CXIX, GEMPYLIDÆ, 877.
PP. Dorsal and anal without finlets.
S. Lateral line armed posteriorly with a series of keeled plates; 2 free anal spines; gill membranes free from isthmus.
CXXV, CARANGIDÆ, 895.
SS. Lateral line armed posteriorly with a sharp, movable, lancet-like spine, or with a few bony tubercles; scales small, rough; gill membranes adherent to isthmus.
CLXVII, TEUTHIDIDÆ, 1688.
SSS. Lateral line unarmed.
T. Throat with 2 long barbels (placed just behind chin); dorsal fins 2 .....CXVII, MULLIDÆ, 855.
TT. Throat without long barbels.
U. Head with a short bony horn before each eye; gill membranes united to isthmus; scales very small, rough.
CLXVI, ZANCLIDÆ, 1687.
UU. Head without bony prominence or horns.
V. Anal fin preceded by 2 free spines (these obsolete in the very old, joined by membrane in the very young).
W. Preopercle entire; teeth moderate if present.
CXXV, CARANGIDÆ, 895.
WW. Preopercle serrate; teeth unequal, some of them very strong.
CXXVI, POMATOMIDÆ, 945.
VV. Anal fin not preceded by free spines.
X. Nostril single on each side; lateral line interrupted; lower pharyngeals united.

Y. Anal spines 2.....CLIX, POMACENTRIDÆ, 1543.
YY. Anal spines 3 to 11. Fresh-water fishes.CLVIII, CICHLIDÆ, 1512.
XX. Nostril double on each side.
Z. Lateral line extending to tip of middle rays of caudal.
a. Anal spines 3, the second strong.
b. Dorsal fins 2, separate; body elongate.
CXLV, CENTROPOMIDÆ, 1116.
bb. Dorsal fin continuous.....CL, HÆMULIDÆ, 1289.
aa. Anal spines 1 or 2, the second large or small.
CLV, SCIÆNIDÆ, 1392.
ZZ. Lateral line not extending beyond base of caudal fin.
c. Gills $3\frac{1}{2}$, the slit behind the last very small or wanting.
d. Mouth not vertical, the lips not fringed; dorsal fin continuous, the spines 8 to 18; scales cycloid; lower pharyngeals united.
e. Teeth in each side of each jaw united, forming a sort of beak.
CLXI, SCARIDÆ, 1620.
ee. Teeth distinct or nearly so, the anterior usually more or less canine .....CLX, LABRIDÆ, 1571.
dd. Mouth nearly vertical, the lips with fleshy fringes; dorsal divided, the spinous part short, of about 4 spines; lower pharyngeals separate ....CXCVII, URANOSCOPIDÆ, 2305.
cc. Gills 4, a long slit behind the fourth.
f. Teeth setiform, like the teeth of a brush; body elevated, longer than deep, the soft fins completely scaled; gill membranes attached to the isthmus.
g. Dorsal fin continuous.....CLXV, CHÆTODONTIDÆ, 1669.
gg. Dorsal fin divided .....CLXIV, EPHIPPIDÆ, 1666.
ff. Teeth not setiform.
h. Body deeper than long, covered with rough scales; dorsal spines 8; anal spines 3; soft fins very long.
CLXIII, CAPROIDÆ, 1663.
hh. Body longer than deep.
i. Gill membranes broadly joined to isthmus; body long and low; no lateral line .....CLXXXVII, GOBIIDÆ, 2188.
ii. Gill membranes free from isthmus or very nearly so.
j. Premaxillaries excessively protractile, their basal process very long, in a groove at top of cranium.
k. Teeth small; scales large, silvery; spines strong.
CLIII, GERRIDÆ, 1366.
kk. Teeth none; spines slender .....CLII, MÆNIDÆ, 1364.
jj. Premaxillaries moderately protractile or not protractile.
l. Lower pharyngeals united; scales large; anal fin with 3 spines and more than 15 soft rays; preopercle entire. (Viviparous fishes of the Californian fauna.)
CLVII, EMBIOTOCIDÆ, 1493.
ll. Lower pharyngeals separate.
m. Body elongate, not compressed, covered with hard grooved scales; jaws box-like..CXXXVIII, TETRAGONURIDÆ, 975.
mm. Body not as above.
n. Lateral line incomplete or interrupted, running close to dorsal fin; dorsal spines very slender, continuous with the soft rays; body low, covered with small scales; anal fin very long.
o. Anal rays fewer than 30; maxillary produced behind.
CXCI, OPISTHOGNATHIDÆ, 2279.
oo. Anal rays more than 30; maxillary not produced behind.
CXCII, BATHYMASTERIDÆ, 2287.
nn. Lateral line, if present, not as above.
p. Scales circular, cycloid, nonimbricate, each with 1 or 2 erect spines; dorsal spines obsolete.
CXII, STEPHANOBERYCIDÆ, 835.

pp. Scales not as above.
q. Anal fin much longer than dorsal; body much compressed, the belly prominent.
r. Dorsal spines none; scales cycloid..CXI, BATHYCLUPEIDÆ, 834.
rr. Dorsal spines few, graduated; anal spines 3.
CXXXIX, PEMPHERIDIDÆ, 977.
qq. Anal fin not much, if any, longer than dorsal.
s. Pseudobranchiæ wanting or covered by skin.
t. Dorsal fin of soft rays, only beginning as a crest on the head; caudal widely forked. Pelagic fishes.
CXXIX, CORYPHÆNIDÆ, 951.
tt. Dorsal fin with spines anteriorly, not beginning on the head. Fresh-water fishes.
u. Anal spines 3 to 10.
v. Dorsal spines 6 to 12; lateral line well developed.
CXLI, CENTRARCHIDÆ, 984.
vv. Dorsal spines about 4; no lateral line; length less than 2 inches.
CXL, ELASSOMATIDÆ, 981.
uu. Anal spines 1 or 2; body oblong or elongate; length less than 8 inches.....CXLIII, PERCIDÆ, 1015.
ss. Pseudobranchiæ developed.
w. Spinous dorsal of 2 or 3 short spines only; anal without spines; scales small, smooth..... CXLVI, SERRANIDÆ, 1126.
ww. Spinous dorsal, if present, not as above.
x. Opercle ending in a long scaly flap; snout depressed, spatulate; mouth very large, the lower jaw projecting.
CXCIV, CHÆNICHTHYIDÆ, 2293.
xx. Opercle not ending in a long scaly flap; snout not greatly depressed.
y. Pectoral fin broad, its lower rays thickened and not branched.
CLVI, CIRRHITIDÆ, 1490.
yy. Pectoral rather narrow at base, its lower rays branched, like the others.
z. Dorsal fin continuous, the spines few, slender; maxillary usually with an enlarged tooth behind; nape sometimes with an adipose appendage; anal fin long, even.
CXC, MALACANTHIDÆ, 2274.
zz. Dorsal fin continuous or divided, not as above.
a. Perch-like fishes, the caudal peduncle not very slender, the scales well developed, ctenoid or cycloid; the dorsal with distinct spines; the anal with at least 1 spine, its soft rays usually few.
b. Maxillary not sheathed by the preorbital, or only partially covered by the edge of the latter; ventral with its accessory scale very small or wanting; pectoral without accessory scale; sheath at base of spinous dorsal little developed; vomer usually with teeth; opercle usually ending in a spine.
c. Precaudal vertebræ with transverse processes from the third or fourth to the last; ribs all but the last 1 to 4 sessile, inserted on the centra behind the transverse processes; anal spines 3; species silvery in color, the dorsal deeply notched, with 10 spines; vertebræ $10+15=25$.
CXLII, KUHLIIDÆ, 1013.
cc. Precaudal vertebræ normal, anteriorly without transverse processes; all or most of the ribs inserted on the transverse processes when these are developed.
d. Anal spines 2 or 1; pseudobranchiæ small; preopercle with a hook-like spine below; vertebræ increased in number (30 to 46). Fresh-water fishes.....CXLIII, PERCIDÆ, 1015.
dd. Anal spines 2, rarely 3; vertebræ 24 or 25; dorsal fin divided. Marine fishes .....CXLIV, CHEILODIPTERIDÆ, 1105.

ddd. Anal spines 3, never 2 nor 1; dorsal fin continuous or divided; vertebræ 24 to 35.

e. Vomer, and usually palatines also, with teeth.

f. Anal fin shorter than dorsal; head not everywhere covered with rough scales; postocular part of head not shortened.
CXLVI, SERRANIDÆ, 1126.

ff. Anal fin scarcely shorter than dorsal and similar to it; head and body everywhere covered with rough scales; body deep, compressed, the posterior part of head shortened.
CXLVIII, PRIACANTHIDÆ, 1236.

ee. Vomer without teeth; dorsal fin continuous; body deep, compressed.....CXLVII, LOBOTIDÆ, 1235.

bb. Maxillary slipping for most of its length under the edge of the preorbital, which forms a more or less distinct sheath; ventrals with an accessory scale; opercle without spines; maxillary without supplemental bone; anal spines 3, rarely 2.

g. Fishes carnivorous; intestines of moderate length; teeth in jaws not all incisor-like; vertebræ usually 24 or 25.

h. Vomer with teeth, these sometimes very small; maxillary long.
CXLIX, LUTIANIDÆ, 1241.

hh. Vomer without teeth; palatines and tongue toothless.

i. Teeth on sides of jaws not molar; maxillaries formed essentially as in the *Serranidæ;* preopercle mostly serrate.
CL, HÆMULIDÆ, 1289.

ii Teeth on sides of jaws molar; maxillaries peculiar in form and in articulation; anterior teeth conical or else more or less incisor-like; preopercle entire...CLI, SPARIDÆ, 1343.

gg. Fishes herbivorous; intestinal canal elongate; anterior teeth in jaws incisor-like; no molars or canines; premaxillaries moderately protractile.....CLIV, KYPHOSIDÆ, 1380.

aa. Mackerel-like fishes, with the caudal peduncle usually very slender, the fin widely forked, the scales various, usually not ctenoid; the dorsal spines various, anal fin long.

j. Scales firm, linear, parchment-like; body compressed; bones of head rough; dorsal spines few; mouth small.
CXXXVII, GRAMMICOLEPIDIDÆ, 973.

jj. Scales not linear, mostly cycloid.

k. Dorsal spines numerous, most of them produced in long filaments; pectorals very long..CXXIV, NEMATISTIIDÆ, 894.

kk. Dorsal spines mostly low, not more than 2 of them filamentous.

l. Dorsal fin very long, all the rays soft; skeleton soft.
CXXXVI, ICOSTEIDÆ, 968.

ll. Dorsal fin with 3 or more spines.

m. Dorsal fin divided, the spines 6 to 12 in number.

n. Scales weak, cycloid; jaws without canines.
CXXVIII, NOMEIDÆ, 948.

nn. Scales ciliate; jaws with canines...CXXVI, POMATOMIDÆ, 945.

nnn. Scales firm, each with a median ridge; no canines.
CXXXIII, STEINEGERIIDÆ, 960.

mm. Dorsal spines 3 or 4, the fin not divided.

o. Scales minute, body oblong, the shoulder girdle moderate.
CXXXIV, CENTROLOPHIDÆ, 962.

oo. Scales rather large, firm; body broad, ovate, the shoulder girdle very strong.....CXXXII, BRAMIDÆ, 956.

BB. Body scaleless, smooth or armed with tubercles, prickles, or scattered bony plates.

C. Breast with a sucking disk.

D. Gill membrane free from the isthmus; no spinous dorsal; a large sucking disk between the ventral fins.
CXCIX, GOBIESOCIDÆ, 2326.

DD. Gill membranes joined to the isthmus; a sucking disk formed of the ventral fins.
E. Skin perfectly smooth; spinous dorsal not distinct. CLXXXIII, LIPARIDIDÆ, 2105.
EE. Skin with tubercles or spines, or else with a distinct spinous dorsal.....CLXXXII, CYCLOPTERIDÆ, 2094.
CC. Breast without sucking disk.
F. Gill membranes broadly attached to the isthmus.
G. Ventrals completely united.....CLXXXVIII, GOBIIDÆ, 2188.
GG. Ventrals widely separated; body depressed; preopercle with a strong spine .....CLXXXVII, CALLIONYMIDÆ, 2184.
FF. Gill membranes nearly or quite free from the isthmus.
H. Anal preceded by 2 free spines (these lost with age; connected by membranes in the very young)..CXXV, CARANGIDÆ, 895.
HH. Anal without free spines.
I. Dorsal and anal fins followed by finlets.CXVIII, SCOMBRIDÆ, 863.
II. Dorsal and anal without finlets.
J. Suborbital with a bony stay; no free anal spines. CLXXIX, COTTIDÆ, 1879.
JJ. Suborbital without bony stay.
K. Mouth very large, nearly horizontal, the teeth sharp; no pseudobranchiæ.....CXCIII, CHIASMODONTIDÆ, 2291.
KK. Mouth large, nearly vertical; body compressed; preopercle armed with spines.....CXCV, TRICHODONTIDÆ, 2295.
AA. Gill openings small, behind, above, or below the pectoral fins, which are more or less pediculate.
L. Gill openings in or behind upper axil of pectorals; mouth small. CCXXIV, OGCOCEPHALIDÆ, 2735.
LL. Gill openings in or behind lower axil of pectoral; mouth large.
M. Head compressed; no pseudobranchiæ. CCXXII, ANTENNARIIDÆ, 2715.
MM. Head depressed; pseudobranchiæ present. CCXXI, LOPHIIDÆ, 2713.

III.—VENTRAL FINS PRESENT, THORACIC OR JUGULAR, THE NUMBER OF RAYS NOT DEFINITELY I, 5.

A. Eyes unsymmetrical, both on the same side of head.
B. Eyes large, well separated; edge of preopercle usually evident. CCXIX, PLEURONECTIDÆ, 2602.
BB. Eyes small, very close together; edge of preopercle hidden by skin; mouth very small.....CCXX, SOLEIDÆ, 2692.
AA. Eyes symmetrical, one on each side of the head.
C. Ventral rays with or without spine, the number of soft rays more than 5.
D. Caudal fin wanting; scales spinous..CCXV, MACROURIDÆ, 2561.
DD. Caudal fin well developed.
E. Tail isocercal, the vertebræ progressively smaller to base of caudal; ventrals jugular; no spines in any of the fins.
F. Jaws and vomer with strong canines; second dorsal and anal deeply notched; no barbel..CCXIII, MERLUCCIIDÆ, 2529.
FF. Jaws and vomer without distinct canines; chin usually with a barbel.....CCXIV, GADIDÆ, 2531.
EE. Tail not isocercal, the last vertebræ not reduced in size.
G. Ventral rays about 15; dorsal fin single, elevated. CXXX, LAMPRIDIDÆ, 953.
GG. Ventral rays I, 3 or I, 5; dorsal very high. CXXXI, PTERACLIDIDÆ, 955.
GGG. Ventral rays I, 6 to I, 10; dorsal with spines.

H. Vent anterior; dorsal spines 3 or 4; scales ctenoid.
CV, APHREDODERIDÆ, 785.
HH. Vent normal.
I. Chin with two long barbels, behind symphysis; dorsal continuous, with 5 spines .....CXVI, POLYMIXIIDÆ, 854.
II. Chin without barbels.
J. Dorsal fin divided, the anterior part of a single slender spine; ventrals elongate.....CCXII, BREGMACEROTIDÆ, 2525.
JJ. Dorsal fin divided, the anterior part of many spines.
K. Body covered with firm serrated scales; anal spines 4; dorsal spines not elevated.....CXV, HOLOCENTRIDÆ, 845.
KK. Body naked or covered with small scales, besides bony plates or warts.....CLXII, ZEIDÆ, 1659.
KKK. Body uniformly covered with cycloid scales; dorsal spines mostly very high and filamentous.
CXXIV, NEMATISTIIDÆ, 894.
JJJ. Dorsal fin continuous, its spines 2 to 8.
L. Suborbitals narrow, not covering the cheeks.
CXIV, BERYCIDÆ, 837.
LL. Suborbitals very broad, covering the cheeks.
CXIII, TRACHICHTHYIDÆ, 836.
CC. Ventral fins with or without spine, the number of soft rays fewer than 5.
M. Gill opening before the pectoral fin.
N. Anal fin present; caudal fin not directed upward.
O. Upper jaw not prolonged into a sword.
P. Dorsal fin with some spines or simple rays.
Q. Dorsal fin without soft rays, composed of spines only.
CC, BLENNIIDÆ, 2344.
QQ. Dorsal fin with soft rays anteriorly, with spines posteriorly; gill membranes joined to isthmus..CCVI, ZOARCIDÆ, 2455.
QQQ. Dorsal fin of spines anteriorly, with soft rays posteriorly.
R. Dorsal spines all separate and unconnected; body scaleless, naked, or with bony plates; ventral with a sharp spine.
XCVIII, GASTEROSTEIDÆ, 742.
RR. Dorsal spines connected by membrane.
S. Suborbital with a bony stay, extending across the cheek, to or toward the preopercle, the cheek sometimes entirely covered with a coat of mail.
T. Pectoral fin divided into 2 parts, 1 of them very long; head bony.....CLXXXVI, CEPHALACANTHIDÆ, 2182.
TT. Pectoral fin not divided.
U. Body entirely covered with an armor of bony plates; head bony.
CLXXXI, AGONIDÆ, 2031.
UU. Body naked, or more or less rough or scaly, not entirely covered by bony plates.
V. Gill opening very small, not extending below upper edge of pectoral; skin everywhere prickly; head very large, bony above.....CLXXX, RHAMPHOCOTTIDÆ, 2029.
VV. Gill opening large, extending downward nearly or quite to lowest pectoral ray.....CLXXIX, COTTIDÆ, 1879.
SS. Suborbital without bony stay.
W. Dorsal spines 2 to 4 only; head very broad, depressed; gills 3; gill membranes broadly united to the isthmus.
x. Ventrals each a strong spine; teeth incisor-like; scales shagreen-like.....CLXVIII, TRIACANTHIDÆ, 1697.
xx. Ventrals not reduced each to a single spine.
CXCVIII, BATRACHOIDIDÆ, 2313.
WW. Dorsal spines numerous; gills 4.
X. Gill membranes separate, free from the isthmus.
Y. Body greatly elongate; lower jaw with a slit at base to permit free motion; lips not fringed.

Z. Soft dorsal and anal with a distinct lobe anteriorly, distinct from spinous part.....CXIX, GEMPYLIDÆ, 877.
ZZ. Soft dorsal and anal without anterior lobe, continuous with spinous part.....CXX, LEPIDOPODIDÆ, 884.
YY. Body moderately elongate; opercles and lips fringed; eyes superior.....CXCVI, DACTYLOSCOPIDÆ, 2297.
XX. Gill membranes broadly united, attached to the isthmus or not.
x. Gill opening moderate or large.....CC, BLENNIIDÆ, 2344.
xx. Gill openings very small, reduced to oblique slits before the pectoral fins.....CCIII, CERDALIDÆ, 2448.
PP. Dorsal fins of soft rays only.
a. Breast with a large sucking dish between ventral fins.
CXCIX, GOBIESOCIDÆ, 2326.
aa. Breast without sucking disk.
b. Body covered with a coat of mail; dorsal very short.
CLXXXI, AGONIDÆ, 2031.
bb. Body not mailed; dorsal many-rayed.
c. Lateral line and base of dorsal beset with prickles; skeleton very soft; body compressed ...CXXXVI, ICOSTEIDÆ, 968.
cc. Lateral line unarmed.
d. Tail isocercal, the vertebral column pointed behind, the last vertebræ very small; hypercoracoid not perforate; no pseudobranchiæ.
e. Caudal fin present.....CCXIV, GADIDÆ, 2531.
ee. Caudal fin wanting.....CCXV, MACROURIDÆ, 2561.
dd. Tail not isocercal, truncate at base of caudal; hypercoracoid perforate.
f. Gill membranes joined to the isthmus; pseudobranchiæ present.
g. Ventral fins under shoulder girdle.....CCVI, ZOARCIDÆ, 2455.
gg. Ventral fins inserted below the eyes.
CCVII, DEREPODICHTHYIDÆ, 2480.
ff. Gill membranes free from the isthmus.
h. Ventral fins inserted below or before the eyes; pseudobranchiæ generally well developed .....CCVIII, OPHIDIIDÆ, 2481.
hh. Ventral fins inserted below shoulder girdle; no pseudobranchiæ.
CCXI, BROTULIDÆ, 2498.
OO. Upper jaw prolonged into a bony sword; dorsal fin long and high; size large.....CXXII, ISTIOPHORIDÆ, 890.
NN. Anal fin wanting; caudal fin distorted or directed upward; body ribbon-like.
i. Ventral fins each of a few slender rays.
CCXVII, TRACHYPTERIDÆ; 2597.
ii. Ventral fins each reduced to a long slender filament.
CCXVI, REGALECIDÆ, 2595.
MM. Gill openings behind the pectoral fins.
j. Gill openings above and behind pectorals; mouth small, low.
CCXXIV, OGCOCEPHALIDÆ, 2735.
jj. Gill openings below and behind pectorals; mouth large, nearly vertical.....CCXXII, ANTENNARIIDÆ, 2715.

IV.—VENTRAL FINS WHOLLY WANTING.

A. Premaxillary and maxillary wanting or grown fast to the palatines; body greatly elongate, eel-shaped; gill openings restricted to the sides; scales minute or wanting; scapular arch not attached to the skull. Eels.
B. Gill openings not very far behind cranium; gape not inordinately distensible; gill arches 4 pairs.
C. Gill openings well developed, leading to large interbranchial slits; tongue present; opercles and branchial bones well developed; scapular arch present.

D. Skin covered with rudimentary embedded scales, usually linear in form, arranged in small groups, and placed obliquely at right angles to those of the neighboring groups; pectorals and vertical fins well developed, the latter confluent about the tail; lateral line present; posterior nostril in front of eyes; tongue with its margins free.

E. Gill openings well separated; branchiostegals long, bent upward behind.

F. Gill openings lateral and vertical; snout conic, the jaws not very heavy; gape longitudinal; lips thick; lower jaw projecting; teeth in cardiform bands on jaws and vomer; eggs minute.....XLIII, ANGUILLIDÆ, 346.

FF. Gill openings horizontal, inferior.

G. Snout very blunt, with very strong jaws; gape transverse; lips obsolete; teeth blunt, in 1 series, on jaws only.
XLIV, SIMENCHELYIDÆ, 348.

GG. Snout conical and slender, the jaws of moderate strength; gape lateral; lips obsolete; tongue but little developed; teeth acute, in bands on jaws and vomer.
XLV, ILYOPHIDIDÆ, 349.

EE. Gill openings inferior, very close together, apparently confluent; branchiostegal rays abbreviated behind; head conical; tongue small; posterior nostrils in front of eye.
XLVI, SYNAPHOBRANCHIDÆ, 350.

DD. Scales wholly wanting; eggs (so far as known) of moderate size, much as in ordinary fishes.

H. Tip of tail with a more or less distinct fin, the dorsal and anal fins confluent around it; the tail sometimes ending in a long filament. Coloration almost always plain, brownish, blackish, or silvery, the fins often black-margined.

I. Posterior nostril without tube, situated entirely above the upper lip.

J. Tongue broad, largely free anteriorly and on sides; vomerine teeth moderate.

K. Pectoral fins well developed; body not excessively elongate; lower jaw not projecting; anterior nostril remote from eye.....XLVII, LEPTOCEPHALIDÆ, 352.

JJ. Tongue narrow, adnate to the floor of the mouth or only the tip slightly free; vomerine teeth well developed, sometimes enlarged.

L. Jaws not attenuate and recurved at tip; gill openings well separated; anterior nostril remote from eye.

M. Pectoral fins well developed; skin thick; skeleton firm; snout moderate; tail not ending in a filiform tip.
XLVIII, MURÆNESOCIDÆ, 358.

MM. Pectoral fins wholly wanting; snout and jaws much produced, the upper longer; jaws straight; skin thin and skeleton weak; tail ending in a filiform tip; gill openings small, subinferior; teeth sharp, subequal, recurved, a long series on the vomer. Deep-sea eels, soft in body, black in color.....XLIX, NETTASTOMATIDÆ, 364.

LL. Jaws long and slender, tapering to a point, recurved at tip; nostrils large, both pairs close in front of eye; gill openings convergent forward, separate or confluent; pectorals and vertical fins well developed; membranes of fins thin, not enveloping the rays; skeleton well developed. Deep-sea eels.....L, NEMICHTHYIDÆ, 366.

II. Posterior nostril close to the edge of the upper lip; tongue more or less fully adnate to the floor of the mouth; teeth subequal.....LI, MYRIDÆ, 370.

HH. Tip of tail without rays, projecting beyond the dorsal and anal fins (not filiform); posterior nostril on the edge of the

upper lip; anterior nostril near tip of snout, usually in a small tube; tongue usually adnate to the floor of the mouth. Coloration frequently variegated.
LII, OPHICHTHYIDÆ, 372.

CC. Gill openings small, roundish, leading to restricted interbranchial slits; tongue wanting; pectoral fins (typically) wanting; opercles feebly developed; fourth gill arch modified, strengthened, and supporting pharyngeal jaws.

N. Scapular arch obsolete or represented by cartilage; heart not far back; pectorals wanting; (skin thick; coloration often variegated) ..... LIII, MURÆNIDÆ, 388.

BB. Gill openings far behind cranium; gape of mouth inordinately distensible; gill arches 5 or 6 pairs; tail excessively long, tapering to a point.

O. Distance from gill opening to vent much greater than that from tip of snout to gill opening.
LIV, SACCOPHARYNGIDÆ, 405.

OO. Distance from gill opening to vent much less than from tip of snout to gill opening..... LV, EURYPHARYNGIDÆ, 406.

AA. Premaxillary and maxillary present, often immovably united to rest of cranium.

P. Gill openings united in a single slit below throat; no pectoral fins; body eel-shaped.....XLI, SYMBRANCHIDÆ, 342.

PP. Gill openings not united in a longitudinal slit.

Q. Dorsal fin wanting; anal fin very long; vent near the head; caudal obsolete; body band-like.....XL, GYMNOTIDÆ, 340.

QQ. Dorsal fin present.

R. Body eel-shaped, contracted at the neck; the vertical fins confluent around the tail; premaxillary and maxillary immovably united to the skull..XLII, DERICHTHYIDÆ, 343.

RR. Body eel-shaped, ending in a long filament, longer than rest of body.

X. No anal or caudal fin.....CCXVIII, STYLEPHORIDÆ, 2601.

XX. No caudal fin; anal present.....CCIV, PTILICHTHYIDÆ, 2451.

RRR. Body not truly eel-shaped.

S. Gill openings far behind pectoral fins; mouth oblique, very large; spinous dorsal represented by fleshy tentacles.
CCXXIII, CERATIIDÆ, 2727.

SS. Gill openings before pectoral fins.

T. Gill membranes broadly united to the isthmus, restricting the gill openings to the sides.

U. Snout tubular, bearing the short, toothless mouth at the end; body mailed.....CIII, SYNGNATHIDÆ, 760.

UU. Snout not tubular.

V. Breast without sucking disk.

W. Dorsal fin single, of spines or undivided rays only.

X. Jaws and vomer with coarse molar teeth.
CCII, ANARHICHADIDÆ, 2445.

XX. Jaws and vomer without molars.

Y. Mouth nearly vertical; dorsal spines slender, rather high.
CCI, CRYPTACANTHODIDÆ, 2442.

YY. Mouth not nearly vertical; dorsal spines moderate or low, some or all of them usually pungent.....CC, BLENNIIDÆ, 2344.

WW. Dorsal fins 2, the anterior of spines, the posterior of soft rays; body short and deep.

Z. Spinous dorsal of 2 or 3 spines; scales rather large, rough or bony .....CLXIX, BALISTIDÆ, 1698.

ZZ. Spinous dorsal of 1 or 2 spines; scales minute, rough, forming a velvety covering.....CLXX, MONACANTHIDÆ, 1712.

WWW. Dorsal fin continuous, of soft rays only.

a. Body oblong or elongate, the back not elevated; dorsal and anal joined to caudal.

b. Pectoral rather narrow, the lower rays similar to the others.
CCVI, ZOARCIDÆ, 2455.
bb. Pectorals very broad, the lower rays procurrent and produced at tip ..... CLXXXIII, LIPARIDIDÆ, 2105.
aa. Body short, not elongate; dorsal and anal free from caudal.
c. Teeth in each jaw confluen into 1.
d. Body compressed, rough ..... CLXXV, MOLIDÆ, 1752.
dd. Body not compressed, spinous .... CLXXIV, DIODONTIDÆ, 1742.
cc. Teeth in each jaw confluent into 2.
x. Back broadly rounded ..... CLXXII, TETRAODONTIDÆ, 1726.
xx. Back with a sharp median ridge.
CLXXIII, CANTHIGASTERIDÆ, 1740.
ccc. Teeth separate; body enveloped in a bony box.
CLXXI, OSTRACIIDÆ, 1721.
VV. Breast with a sucking disk.
e. Skin perfectly smooth; dorsal continuous or slightly notched.
CLXXXIII, LIPARIDIDÆ, 2105.
ee. Skin more or less tubercular; dorsal usually divided.
CLXXXII, CYCLOPTERIDÆ, 2094.
TT. Gill membranes free from the isthmus.
f. Vent at the throat.
g. Vertical fins confluent; body elongate, almost eel-shaped.
CCX, FIERASFERIDÆ, 2494.
gg. Vertical fins separate; body oblong, scaly.
XCIII, AMBLYOPSIDÆ, 702.
ff. Vent posterior, not at the throat.
h. Caudal fin wanting; body naked, greatly elongate.
CXXI, TRICHIURIDÆ, 888.
hh. Caudal fin present.
i. Upper jaw prolonged into a sword; size very large.
CXXIII, XIPHIIDÆ, 893.
ii. Upper jaw not prolonged into a sword.
j. Belly with a series of bony scutes along its edge; body much compressed ..... LXI, CLUPEIDÆ, 417.
jj. Belly not armed with scutes.
k. Mouth inordinately large, formed like the mouth of a whale, with sharp teeth; no scales ... LXXIV, CETOMIMIDÆ, 548.
kk. Mouth not inordinately large, not peculiar in form.
l. Body ovate, much compressed.
m Scales small, cycloid, silvery ..... CXXXV, STROMATEIDÆ, 964.
mm. Scales wanting; caudal peduncle very slender.
CXXXVI, ICOSTEIDÆ, 968.
l. Body oblong or elongate, much longer than deep.
n. Gill membranes broadly united; teeth present.
o Dorsel fin of spines only ..... CC, BLENNIIDÆ, 2344.
oo. Dorsal fin of soft rays only; body eel-shaped.
CCV, SCYTALINIDÆ, 2453.
ooo. Dorsal fin single, the posterior half of soft rays, the anterior of spines; body elongate, covered with small scales.
CC, BLENNIIDÆ, 2344.
oooo. Dorsal fins 2, the anterior of slender spines, posterior soft, body naked ..... CLXXIX, COTTIDÆ, 1879.
nn. Gill membranes separate.
p. Jaws toothless, the lower jaw projecting; body scaly, with cross folds of skin ..... CX, AMMODYTIDÆ, 831.
pp. Jaws with teeth.
q. Body naked, without folds of skin; no pseudobranchiæ.
CCIX, LYCODAPODIDÆ, 2491.
qq. Body with small scales; pseudobranchiæ preseut; head with very large mucous pores; lower jaw very strong.
CXXXVIb, ZAPRORIDÆ, 2849.

GLOSSARY OF TECHNICAL TERMS.*

Abdomen. Belly.

Abdominal. Pertaining to the belly; said of the ventral fins of fishes when inserted considerably behind the pectorals, the pelvic bones to which the ventral fins are attached having no connection with the shoulder girdle.

Abortive. Remaining or becoming imperfect.

Actinosts. A series of bones at the base of the pectoral rays.

Acuminate. Tapering gradually to a point.

Acute. Sharp-pointed.

Adipose fin. A peculiar, fleshy, fin-like projection behind the dorsal fin, on the backs of salmons, catfishes, etc.

Adult. A mature animal.

Airbladder. A sac filled with air, lying beneath the backbone of fishes, corresponding to the lungs of higher vertebrates.

Alisphenoid. A small bone on the anterior lateral wall of the brain case.

Amphicœlian. Double concave; said of vertebræ.

Anadromous. Running up; said of marine fishes which run up rivers to spawn.

Anal. Pertaining to the anus or vent.

Anal fin. The fin on the median line behind the vent, in fishes.

Anchylosed. Grown firmly together.

Angular. A small bone on the posterior end of the mandible.

Antrorse. Turned forward.

Anus. The external opening of the intestine; the vent.

Arterial bulb. The muscular swelling, at the base of the great artery, in fishes.

Articular. The bone of the mandible supporting the dentary.

Articulate. Jointed.

Atlas. The first vertebra.

Atrophy. Nondevelopment.

Attenuate. Long and slender, as if drawn out.

Auditory capsule. The ventrolateral swelling of the skull.

Barbel. An elongated fleshy projection, usually about the head, in fishes.

Basal. Pertaining to the base; at or near the base.

Basibranchials. A lower median series of bones of the branchial arches.

Basioccipital. A median posterior ventral bone of the skull to which the atlas is attached.

Basis cranii. Formed by shelves of bone developed from the inner sides of the prootics which meet and form a roof to the myodome and a floor to the brain cavity.

Bicolor. Two-colored.

Bicuspid. Having 2 points.

Brachial ossicles. Synonymous with actinosts, q. v.

Branchiæ. Gills; respiratory organs of fishes.

Branchial. Pertaining to the gills.

Branchihyals. Small bones at base of gill arches.

Branchiostegals. The bony rays supporting the branchiostegal membranes, under the head of a fish, below the opercular bones, and behind the lower jaw.

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Bristle. A stiff hair, or hair-like feather.
Buccal. Pertaining to the mouth.
Caducous. Falling off early.
Cæcal. Of the form of a blind sac.
Cæcum. An appendage of the form of a blind sac, connected with the alimentary canal at the posterior end of the stomach, or pylorus.
Canines. The teeth behind the incisors—the "eye-teeth;" in fishes, any conical teeth in the front part of the jaws, longer than the others.
Cardiform (teeth). Teeth coarse and sharp, like wool cards.
Carinate. Keeled; having a ridge along the middle line.
Carotid. The great artery running to the head.
Carpus. The wrist.
Catadromous. Running down; said of fresh-water species which run down to the sea to spawn.
Caudal. Pertaining to the tail.
Caudal fin. The fin on the tail of fishes and whales.
Caudal peduncle. The region between the anal and caudal fins in fishes.
Cavernous. Containing cavities, either empty or filled with a mucous secretion.
Centrum. The body of a vertebra.
Cephalic fins. Fins on the head of certain rays; a detached portion of the pectoral.
Ceratobranchials. Bones of the branchial arches just below their angle.
Ceratohyal. One of the hyoid bones.
Chiasma. Crossing of the fibers of the optic nerve.
Chin. The space between the rami of the lower jaw.
Ciliated. Fringed with eyelash-like projections.
Cirri. Fringes.
Claspers. Organs attached to the ventral fins in the male of sharks, skates, etc.
Clavicle. The collar bone, or lower anterior part of shoulder girdle, not entering into socket of arm.
Compressed. Flattened laterally.
Condyle. Articulating surface of a bone.
Coracoid. The principal bone of the shoulder girdle in fishes; otherwise a bone or cartilage on the ventral side, helping to form the arm socket. Synonymous with hypercoracoid, q. v.
Cranial. Pertaining to the cranium or skull.
Ctenoid. Rough-edged; said of scales when the posterior margin is minutely spinous or pectinated.
Cycloid. Smooth-edged; said of scales not ctenoid, but concentrically striate.
Deciduous. Temporary; falling off.
Decurved. Curved downward.
Dentary. The principal or anterior bone of the lower jaw or mandible, usually bearing the teeth.
Dentate. With tooth-like notches.
Denticle. A little tooth.
Depressed. Flattened vertically.
Depth. Vertical diameter (usually of the body of fishes).
Dermal. Pertaining to the skin.
Diaphanous. Translucent.
Distal. Remote from point of attachment.
Dorsal. Pertaining to the back.
Dorsal fin. The fin on the back of fishes.
Emarginate. Slightly forked or notched at the tip.
Endoskeleton. The skeleton proper; the inner bony framework of the body.
Enteron. The alimentary canal.
Epibranchials. The bones directly above the angle of the branchial arches.
Epihyal. One of the hyoid bones.
Epipleurals. Rays of bone attached to the ribs and anterior vertebræ usually touching the skin in the vicinity of the lateral line.

Erectile. Susceptible of being raised or erected.
Ethmoid. A median anterior bone of the skull.
Exoccipitals. Two bones of the skull, 1 on each side of the foramen magnum.
Exoskeleton. Hard parts (scales, scutes) on the surface of the body.
Exserted. Projecting beyond the general level.
Extralimital. Beyond the limits (of this book).
Facial. Pertaining to the face.
Falcate. Scythe-shaped; long, narrow, and curved.
Falciform. Curved, like a scythe.
Fauna. The animals inhabiting any region, taken collectively.
Femoral. Pertaining to the femur, or proximal bone of the hinder leg.
Filament. Any slender or thread-like structure.
Filiform. Thread form.
Fontanel. An unossified space on top of head covered with membrane.
Foramen. A hole or opening.
Foramen magnum. The aperture in the posterior part of the skull for the passage of the spinal cord.
Forehead. Frontal curve of head.
Forficate. Deeply forked; scissors-like.
Fossæ (nasal). Groves in which the nostrils open.
Frontal bone. Anterior bone of top of head, usually paired.
Fulcra. Rudimentary spine-like projections extending on the anterior rays of the fins of ganoid fishes.
Furcate. Forked.
Fusiform. Spindle-shaped; tapering toward both ends, but rather more abruptly forward.
Ganglion. A nerve center.
Ganoid. Scales or plates of bone covered by enamel.
Gape. Opening of the mouth.
Gill arches. The bony arches to which the gills are attached.
Gill openings. Openings leading to or from the branchiæ.
Gill rakers. A series of bony appendages, variously formed, along the inner edge of the anterior gill arch.
Gills. Organs for breathing the air contained in water.
Glabrous. Smooth.
Glossohyal. The tongue bone.
Graduated (spines). Progressively longer backward, the third being as much longer than the second as second is longer than first.
Granulate. Rough with small prominences.
Gular. Pertaining to the *gula*, or upper foreneck.
Hæmal arch. An arch under a hæmal spine for the passage of a blood vessel.
Hæmal canal. The series of hæmal arches as a whole.
Hæmal spine. The lowermost spine of a caudal vertebra, in fishes.
Hæmopophyses. Appendages on the lower side of abdominal vertebræ, in fishes.
Height. Vertical diameter.
Heterocercal. Said of the tail of a fish when unequal; the backbone evidently running into the upper lobe.
Homocercal. Said of the tail of a fish when not evidently unequal; the backbone apparently stopping at the middle of the base of the caudal fin.
Humerus. Bone of the upper arm.
Hyoid. Pertaining to the tongue.
Hyoid apparatus. Formed by a series of bones extending along the inner side of the mandible and supporting the tongue.
Hyomandibular. A bone by which the posterior end of the suspensorium is articulated with the skull; the supporting element of the suspensorium, the mandible, the hyoid apparatus, and the opercular apparatus.
Hypercoracoid. The upper of the 2 bones attached to the clavicle, indirectly bearing the pectoral fin.

Hypleural. The modified last vertebra supporting the caudal fin.
Hypobranchials. Bones of the branchial arches below the ceratobranchials.
Hypocoracoid. The lower of the 2 bones attached to the clavicle behind.
Hypohyals. Small bones, usually 4, by which the respective sides of the hyoid apparatus are joined.
Imbricate. Overlapping, like shingles on a roof.
Imperforate. Not pierced through.
Inarticulate. Not jointed.
Incisors. The front or cutting teeth.
Inferior pharyngeals. Synonymous with pharyngeals, q. v.
Infraoral. Below the mouth.
Interhæmal spines. Elements supporting the anal fin.
Interhæmals. Bones to which anal rays are attached, in fishes.
Interhyal. Upper hyoid bone attached to hyomandibular.
Intermusculars. Synonym of epipleurals, q. v.
Interneural spines. Elements supporting the dorsal fins.
Interspinous bones. The interneurals and the interhæmals.
Intermaxillaries. The premaxillaries; the bones forming the middle of the front part of the upper jaw, in fishes.
Interneurals. Bones to which dorsal rays are attached, in fishes.
Interopercle. Membrane bone between the preopercle and the branchiostegals.
Interorbital. Space between the eyes.
Interspinals. Bones to which fin rays are attached (in fishes); inserted between neural spines above and hæmal spines below.
Isocercal (tail). Last vertebræ progressively smaller and ending in median line of caudal fin, as in the codfish.
Jugular. Pertaining to the lower throat; said of the ventral fins, when placed in advance of the attachment of the pectorals.
Keeled. Having a ridge along the middle line.
Lacustrine. Living in lakes.
Lamellæ. Plate-like processes like those inside the bill of a duck.
Larva. An immature form, which must undergo change of appearance before becoming adult.
Lateral. To or toward the side.
Lateral line. A series of muciferous tubes forming a *raised line* along the sides of a fish.
Lateral processes. Synonym of parapophyses, q. v.
Laterally. Sidewise.
Lunate. Form of the new moon; having a broad and rather shallow fork.
Mandible. Under jaw.
Maxilla, or *maxillary.* Upper jaw.
Maxillaries. Outermost or hindmost bones of the upper jaw, in fishes; they are joined to the premaxillaries in front, and usually extend farther back than the latter.
Mesethmoid. Synonym of ethmoid, q. v.
Mesopterygoid. A bone of the suspensorium.
Metapterygoid. A bone of the suspensorium, or chain supporting the lower jaw.
Molars. The grinding teeth; posterior teeth in the jaw.
Muciferous. Producing or containing mucus.
Myocomma. A muscular band.
Myodome. Cavity under the brain cavity for the reception of the rectus muscles of the eye.
Nape. Upper part of neck, next to the occiput.
Nares. Nostrils, anterior and posterior.
Nasal. Pertaining to the nostrils.
Nasal plate. Plate in which the nostrils are inserted.
Neural arch. An opening through the base of the neural spine for the passage of the spinal cord.

Neural canal. The neural arches as a whole.
Neural processes. Two plates rising vertically, 1 on each side of the centrum of the vertebra, which unite toward their ends and form a spine.
Neural spine. The uppermost spine of a vertebra.
Nictitating membrane. The third or inner eyelid of birds, sharks, etc.
Notochord. A cellular chord which in the embryo precedes the vertebral column.
Nuchal. Pertaining to the nape or *nucha*.
Obsolete. Faintly marked; scarcely evident.
Obtuse. Blunt.
Occipital. Pertaining to the occiput.
Occipital condyle. That part of the occipital bone modified to articulate with the atlas.
Occiput. Back of the head.
Ocellate. With eye-like spots, generally roundish and with a lighter border.
Oid (suffix). Like; as *Percoid*, perch-like.
Opercle, or *operculum.* Gill cover; the posterior membrane bone of the side of the head, in fishes.
Opercular bones. Membrane bones of the side of the head, in fishes.
Opercular flap. Prolongation of the upper posterior angle of the opercle, in sunfishes.
Opisthocœlian. Concave behind only; said of vertebræ which connect by ball-and-socket joints.
Opisthotic. A bone of the skull to which the lower limb of the post-temporal usually articulates.
Orbicular. Nearly circular.
Orbit. Eye socket.
Osseous. Bony.
Ossicula auditus. Bones of the ear, in fishes.
Osteology. Study of bones.
Oviparous. Producing eggs which are developed after exclusion from the body, as in all birds and most fishes.
Ovoviviparous. Producing eggs which are hatched before exclusion, as in the dogfish and garter snake.
Ovum. Egg.
Palate. The roof of the mouth.
Palatines. Membrane bones of the roof of the mouth, 1 on each side extending outward and backward from the vomer.
Palustrine. Living in swamps.
Papilla. A small fleshy projection.
Papillose. Covered with papillæ.
Parapophyses. The lateral projections on some of the abdominal vertebræ to support ribs.
Parasphenoid. Bone of roof of mouth behind the vomer. Synonym of prefrontal.
Parietal. Bone of the side of head above.
Parotic process. A posterior lateral process of the skull formed by the pterotic and opisthotic.
Pectinate. Having teeth like a comb.
Pectoral. Pertaining to the breast.
Pectoral fins. The anterior or uppermost of the paired fins, in fishes, corresponding to the anterior limbs of the higher vertebrates.
Pelagic. Living on or in the high seas.
Pelvic girdle. The bones supporting the ventral fins or pelvics.
Pelvis. The bones to which the hinder limbs (ventral fins in fishes) are attached.
Perforate. Pierced through.
Peritoneum. The membrane lining the abdominal cavity.

Pharyngeal bones. Bones behind the gills and at the beginning of the œsophagus of fishes, of various forms, almost always provided with teeth; usually 1 pair below and 2 pairs above. They represent a fifth gill arch.

Pharyngobranchials. Upper elements of the branchial arches, usually bearing teeth.

Pharyngognathous. Having the lower pharyngeal bones united.

Physoclistous. Having the air bladder closed.

Physostomous. Having the air bladder connected by a tube with the alimentary canal.

Pigment. Coloring matter.

Pineal body. A small ganglion in the brain; a rudiment of an optic lobe, which in certain lizards (and in extinct forms) is connected with a third or median eye.

Pituitary body. A small ganglion in the brain.

Plicate. Folded; showing transverse folds or wrinkles.

Plumbeous. Lead colored; dull bluish gray.

Polygamous. Mating with more than 1 female.

Postclavicle. A ray composed of 1 or 2 bones attached to the inner upper surface of the clavicle and extending downward.

Postorbital. Behind the eye.

Post-temporal. The bone, in fishes, by which the shoulder girdle is suspended to the cranium.

Præcoracoid. A portion of coracoid more or less separated from the rest.

Præcoracoid arch. An arch in front of the coracoid in most soft-rayed fishes.

Prefrontals. Bones forming lateral projections at the anterior end of the skull.

Premaxillaries. The bones, 1 on either side, forming the front of the upper jaw in fishes. They are usually larger than the maxillaries and commonly bear most of the upper teeth.

Premolars. The small grinders; the teeth between the canines and the true molars.

Preocular. Before the eye.

Preopercle. The membrane bone lying in front of the opercle and more or less nearly parallel with it.

Preorbital. The large membrane bone before the eye, in fishes.

Procœlian. Concave in front only.

Procurrent (fin). With the lower rays inserted progressively farther forward.

Projectile. Capable of being thrust forward.

Prootic. A bone forming an anterolateral ossification of the brain case.

Protractile. Capable of being drawn forward.

Proximal. Nearest.

Pseudobranchiæ. Small gills developed on the inner side of the opercle, near its junction with the preopercle.

Pterotic. A bone at the posterior lateral process of the skull.

Pterygoids. Bones of roof of mouth in fishes, behind the palatines.

Pubic bones. Same as pelvic bones, q. v.

Pubis. Anterior lower part of pelvis.

Pulmonary. Pertaining to the lungs.

Punctate. Dotted with points.

Pyloric cæca. Glandular appendages in the form of blind sacs opening into the alimentary canal of most fishes at the *pylorus*, or passage from the stomach to the intestine.

Quadrate. A bone of the suspensorium on which the mandible is hinged.

Quincunx. Set of 5 arranged alternately, thus

Radius. Outer bone of forearm.

Ray. One of the cartilaginous rods which support the membrane of the fin of a fish.
Recurved. Curved upward.
Reticulate. Marked with a network of lines.
Retrorse. Turned backward.
Rudimentary. Undeveloped.
Rugose. Rough with wrinkles.
Sacral. Pertaining to the *sacrum*, or vertebræ of the pelvic region.
Scapula. Shoulder blade; in fishes, the bone of the shoulder girdle below the post-temporal.
Scapular arch. Shoulder girdle.
Scute. Any external bony or horny plate.
Second dorsal. The posterior or soft part of the dorsal fin, when the two parts are separated.
Septum. A thin partition.
Serrate. Notched, like a saw.
Sessile. Without a stem or peduncle.
Setaceous. Bristly.
Setiform. Bristle-like.
Shaft. Stiff axis of a quill.
Shoulder girdle. The bony girdle posterior to the head, to which the anterior limbs are attached (post-temporal, scapula, and coracoid or clavicle).
Soft dorsal. The posterior part of the dorsal fin in fishes, when composed of soft rays.
Soft rays. Fin rays which are articulate and usually branched.
Spatulate. Shaped like a spatula.
Sphenoid. Basal bone of skull.
Sphenotic. A lateral bone of the skull.
Spine. Any sharp projecting point; in fishes those fin rays which are unbranched, inarticulate, and usually, but not always, more or less stiffened.
Spinous. Stiff or composed of spines.
Spinous dorsal. The anterior part of the dorsal fin when composed of spinous rays.
Spiracles. Openings in the head and neck of some fishes and batrachians.
Stellate. Star-like; with radiating ridges.
Striate. Striped or streaked.
Sub (in composition). Less than; somewhat; not quite; under, etc.
Subcaudal. Under the tail.
Subopercle. The bone immediately below the opercle (the suture connecting the two often hidden by scales).
Suborbital. Below the eye.
Suborbital stay. A bone extending from one of the suborbital bones in certain fishes, across the cheek, to or toward the preopercle.
Subulate. Awl-shaped.
Superciliary. Pertaining to the region of the eyebrow.
Superior pharyngeals. Synonym of pharyngobranchials, q. v.
Supplemental maxillary. A small bone lying along upper edge of the maxillary in some fishes.
Supraclavicle. A bone interposed between the clavicle and the post-temporal.
Supraoccipital. The bone at posterior part of skull in fishes, usually with a raised crest above.
Supraoral. Above the mouth.
Supraorbital. Above the eye.
Suprascapular. The post-temporal or bone by which the shoulder girdle in fishes is joined to the skull.
Suspensorium. The chain of bones from the hyomandibular to the palatine.
Suspensory bones. Bones by which the lower jaw, in fishes, is fastened to the skull.

Suture. The line of union of 2 bones, as in the skull.
Symphysis. Point of junction of the 2 parts of lower jaw; tip of chin.
Symplectic. The bone in fishes that keys together the hyomandibular and quadrate posteriorly.
Synonym. A different word having the same or a similar meaning.
Synonymy. A collection of different names for the same group, species, or thing; "A burden and a disgrace to science." (*Coues.*)
Tail. In fishes (usually), the part of the body posterior to the anal fin. (Often used more or less vaguely.)
Temporal. Pertaining to the region of the temples.
Terete. Cylindrical and tapering.
Terminal. At the end.
Tessellated. Marked with little checks or squares, like mosaic work.
Thoracic. Pertaining to the chest; ventral fins are thoracic when attached immediately below the pectorals, as in the perch, the pelvic bones being fastened to the shoulder girdle.
Transverse. Crosswise.
Trenchant. Compressed to a sharp edge.
Truncate. Abrupt, as if cut squarely off.
Tubercle. A small excrescence, like a pimple.
Type (of a genus). The species upon which was based the genus to which it belongs.
Type (of a species). The particular specimen upon which the original specific description was based.
Type locality. The particular place or locality at which the type specimen was collected.
Typical. Of a structure the most usual in a given group.
Ultimate. Last or farthest.
Unicolor. Of a single color.
Vent. The external opening of the alimentary canal.
Ventral. Pertaining to the abdomen.
Ventral fins. The paired fins behind or below the pectoral fins in fishes, corresponding to the posterior limbs in the higher vertebrates.
Ventral plates. In serpents or fishes, the row of plates along the belly between throat and vent.
Ventricle. One of the thick-walled chambers of the heart.
Versatile. Capable of being turned either way.
Vertebra. One of the bones of the spinal column.
Vertical. Up and down.
Vertical fins. The fins on the median line of the body; the dorsal, anal, and caudal fins.
Villiform. Said of the teeth of fishes when slender and crowded into velvety bands.
Viscous. Slimy.
Viviparous. Bringing forth living young.
Vomer. In fishes, the front part of the roof of the mouth; a bone lying immediately behind the premaxillaries.
Zygapophyses. Points of bone affording to the vertebræ more or less definite articulation with each other.

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OF

NORTH AND MIDDLE AMERICA:

A DESCRIPTIVE CATALOGUE OF THE SPECIES OF FISH-LIKE VERTEBRATES FOUND IN THE WATERS OF NORTH AMERICA, NORTH OF THE ISTHMUS OF PANAMA.

BY

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PRESIDENT OF THE LELAND STANFORD JUNIOR UNIVERSITY AND OF THE CALIFORNIA ACADEMY OF SCIENCES,

AND

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PREFACE.

This volume is fourth and last of a descriptive catalogue of the fishes and fish-like vertebrates of North and Middle America. Part I, *Branchiostomatidæ* to *Priacanthidæ* inclusive (pp. 1 to 1240), was published October 3, 1896; Part II, *Lutianidæ* to *Cephalicanthidæ* inclusive (pp. 1241 to 2183), was published October 3, 1898; Part III, *Callionymidæ* to *Ogcocephalidæ* inclusive, including also "Addenda," an "Artificial Key to the Families of the True Fishes," a "Glossary of Technical Terms," and an "Index" complete for Parts I, II, and III (pp. 2183*a* to 3136), was published November 28, 1898; and Part IV, the present volume, appears on June 26, 1900.

Since the publication of Part III, investigations by Dr. Jordan, in Mexico, and by Dr. Evermann, in Puerto Rico, have added greatly to our knowledge of the fishes of those regions, and have made it desirable to incorporate in the present volume still further addenda.

Recent studies by Dr. Günther, of certain Linnæan types, show that some changes in nomenclature are necessary, which are also included.

DAVID STARR JORDAN.
BARTON WARREN EVERMANN.

LELAND STANFORD JUNIOR UNIVERSITY,
PALO ALTO, SANTA CLARA COUNTY, CALIFORNIA.
March 15, 1900.

A SYSTEMATIC ARRANGEMENT OF THE FISHES OF NORTH AND MIDDLE AMERICA.

In these pages the authors exhibit, as clearly as the method will permit, their present views as to the genetic relations of the fishes and fish-like vertebrates of North and Middle America. This list is, in fact, a Table of Contents complete for the four volumes and corrected to include the Addenda (pp. 2745-2873 of Part III and pp. 3137-3197 of Part IV). From this Systematic Arrangement it is seen that the fish fauna of North and Middle America, as now understood by the present authors, embraces 3 classes, 30 orders, 225 families, 1113 genera, 325 subgenera, 3263 species, and 133 subspecies.

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ADDITIONAL ADDENDA.

Since the publication of Part III of this work a number of new genera and species of fishes have been described from localities within our limits, and our knowledge regarding the relations and distribution of previously known species has been enlarged. These additions and corrections are given in the following pages:

Page 130. After *Hexamenatichthys rugispinus* (Cuvier & Valenciennes), insert the following:

195 (a). GALEICHTHYS LABIATUS (Boulenger).

Head $3\frac{1}{2}$; width of head $1\frac{2}{5}$ in its length; depth 5; eye 9 in head. D. I, 7; A. 17. Band of premaxillary teeth 4 times longer than wide, the width half the eye; palatine teeth conical, in 2 small oblique groups, much smaller than eye, and separated by a space equal to $\frac{3}{4}$ the length of premaxillary band; eye situated above level of mouth, in anterior half of head, 4 in interocular space; occiput and occipital prolongation granular, this last a little longer than wide, with an obtuse spine; fontanelle narrow, not distinct, followed by a groove which does not reach the occipital prolongation; lips thick, the upper overhanging the lower, as in *G. rugispinus*, to which this species is closely related; barbels flattened; maxillary $1\frac{1}{3}$ in head, not reaching edge of opercle; external mandible $1\frac{1}{2}$ times as long as internal, 2 in head; gill membrane with a free, unbroken edge; dorsal spine with indistinct serrations, covered with skin, its length a little less than $\frac{1}{3}$ head; adipose dorsal as long at base as rayed dorsal, twice as far from it as from the caudal; humeral prolongation smooth; pectoral spine $2\frac{1}{2}$ in head, enveloped in skin like the dorsal spine, much shorter than the soft rays; ventral shorter, reaching origin of anal; caudal deeply forked, with pointed lobes; caudal peduncle $2\frac{1}{2}$ times longer than deep; no maxillary pore. Blackish gray above, silvery below; all the fins blackish. Length 470 mm. Known only from a single specimen from Rio Peripa, Ecuador. (Boulenger.) (*labiatus*, having large lips.)

Arius labiatus, BOULENGER, Bollettino dei Mus. di Zool. ed. Anat. Comp. della Univ. di Torino, Vol. XIII, No. 329, 6, Dec. 2, 1898, Rio Peripa, Ecuador. (Coll. Dr. Enrico Festa.)

Page 132. After *Tachysurus melanopus* (Günther), insert the following:

200 (a). **TACHYSURUS FESTÆ** (Boulenger).

Head 4; depth 4; eye 6½, above level of mouth, in anterior part of head. D. 17; A. 23. Premaxillary band of teeth 4 times longer than broad, its width 2½ in eye, or equal to width of groups of vomer and palatine teeth, these last granular, forming 2 large, oblique groups, separated on the median line by a space equal to ⅓ diameter of eye; width of head 1¼ in its length; occiput and occipital prolongation granular, the last as long as wide, and with blunt spine; fontanelle narrow, commencing in a groove between the anterior nostrils and reaching occiput, not reaching occipital prolongation; barbels flattened; maxillary as long as head, reaching beyond base of pectoral spine; external mandible a little shorter, as long as the internal; gill-membrane with a free border broken at the isthmus; anal spine striated, 1¼ in head, its anterior edge feebly toothed except at extremity, which has, like the posterior edge, stronger and more retrorse teeth; adipose dorsal twice as far from rayed dorsal as from caudal, its base 1½ in base of rayed dorsal; pectoral spine 1½ in head, its external edge furnished with a series of soft, small tubercles on its basal half, anterior edge armed with feeble retrorse teeth; ventral shorter, reaching origin of anal; caudal deeply forked; caudal peduncle twice as long as deep; axillary pore present, much smaller than the nostril. Color steel blue above, silvery below. This species closely resembles *Tachysurus liropus*, Bristol. Length 210 mm. One specimen known, from Narrangal, Ecuador. (Boulenger.) (Named for the collector of the type, Dr. Enrico Festa.)

Arius festæ, BOULENGER, Bollettino dei Mus. di Zool. ed. Anat. Comp. della Univ. di Torino, Vol. XIII, No. 329, 5, Dec. 2, 1898, Narrangal, Ecuador.

Page 135. After *Ictalurus meridionalis* (Günther), insert:

76 (a). **ISTLARIUS**, Jordan & Snyder.

Istlarius, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 118 (*balsanus*).

Body rather deep and compressed; head not widened, nor greatly depressed; eye large; lower jaw included; teeth in villiform bands on premaxillaries and dentaries; the premaxillary band convex anteriorly, with a short angular posterior extension on each side, no division of the band at symphysis; dentary band broad anteriorly, growing narrow and pointed posteriorly, with a distinct median division; no teeth on vomer or palatines; villiform teeth on upper and lower pharyngeals; gill-rakers on first arch 17, long and slender; branchiostegals 8; air bladder very large, extending almost to posterior end of body cavity, divided by a transverse constriction into two parts of nearly equal length, the anterior heart-shaped, posterior part oval; supraoccipital bone widely separated from interspinal; humeral process short, almost hidden by the skin; lateral line extending from below insertion of dorsal to caudal; skin covered with minute, hairlike villi; skin of head completely concealing bones of skull; barbels 8. Spines with

distal parts soft, not branched, continuous with the hard parts; basal part of pectoral spine grooved posteriorly, weakly serrate above the groove.

Istlarius has some of the characters of the genus *Leptops*, notably the dentition of the upper jaw and the weakness of the fin-spines; but it more closely resembles *Ictalurus*, and its relationship is probably with that genus.

(Named for the Rio Ixtla, the type locality of the type species.)

208 (a). **ISTLARIUS BALSANUS**, Jordan & Snyder.

Head 4; depth $4\frac{2}{3}$; depth of caudal peduncle $2\frac{1}{2}$ in head; eye $5\frac{1}{2}$; snout $2\frac{2}{3}$; distance between eyes $2\frac{1}{3}$; height of dorsal $1\frac{2}{3}$; length of base of dorsal 3; height of anal $1\frac{2}{3}$; length of base of anal 1; length of pectoral $1\frac{1}{2}$; ventrals $1\frac{2}{3}$; caudal 1; D. I, 6; A. 24. Body deep and somewhat compressed, deepest above ventrals, widest between pectorals; head narrow, not greatly depressed; eye large, nearer tip of snout than to posterior edge of opercle a distance equal to diameter of eye; interorbital space convex; width of mouth $2\frac{1}{2}$ in head, lower jaw included; upper jaw projecting a distance equal to diameter of pupil; barbels 8; of the inferior ones the median pair shorter; distance between their bases equal to the diameter of pupil; the outer pair when extended directly backward reach the edges of gill covers; maxillary barbels longest, reaching upper angle of gill opening; nostril barbels reaching middle of pupil. Teeth in broad villiform bands on premaxillaries and dentaries, the band on upper jaw convex anteriorly, with a short, angular posterior extension on each side, no apparent division of the band at symphysis; band on lower jaw broad anteriorly, narrow and pointed posteriorly, a distinct median division; no teeth on vomer or palatines; upper pharyngeal teeth in oval villiform bands; lower pharyngeal teeth in 2 narrow oblong bands; gill-rakers on first arch 17, long and slender; branchiostegals 8; anterior nostril tubular, the posterior with a raised rim extending on each side from the barbel to the posterior edge of the opening, where it is divided; skin of head completely concealing the bones of skull; supraoccipital bone not in contact with interspinal; humeral process about as long as vertical diameter of eye, almost hidden by the thick skin; lateral line extending from a perpendicular through insertion of dorsal to caudal; skin covered with minute, hair-like villi; dorsal spine with its distal third soft, preceded by a small, angular, immature spine; first branched ray longest, the others gradually shorter; adipose fin large, above middle of anal; length of the posterior free edge 3 times diameter of pupil; third or fourth anal ray longest, edge of fin rounded posteriorly; caudal deeply forked, the lower lobe rounded, the upper rather pointed; pectoral rays I, 11, distal two-thirds of spine soft, not branched, continuous with the hard part; basal part grooved posteriorly, weakly serrate above the groove; ventrals reaching origin of anal. Color bluish slate above, light silvery below; a few small dark spots on the head and body; fins with dusky coloring; inferior barbels light; maxillary barbels with upper half dark; nasal barbules with light edges. Some specimens have many well-defined color

spots, while others have few or none. The young have no spots. Our specimens vary in length from 10 to 60 centimeters.

Istlarius balsanus has a large and rather complex air bladder. It lies close to the spinal column and extends almost to the posterior end of the body cavity. It is divided by a deep transverse constriction into two halves. The anterior part is heart-shaped, constricted dorso-ventrally. It is separated by a T-shaped partition into 3 chambers. Of these the anterior, transverse chamber is partly divided on the median line by a fold of the dorsal wall of the bladder over the vertebral column. The transverse chamber is connected on each side with the 2 posterior lateral chambers by large openings in the ends of the transverse wall. The posterior half of the bladder is without partitions. It is connected with the left lateral chamber only by a small opening. (Jordan & Snyder.)

Known only from Rio Ixtla at Puente de Ixtla, Morelos, Mexico. (Type, No. 6149, L. S. Jr. Univ. Mus. Coll. Jordan & Snyder.)

Istlanus balsanus, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 118, Rio Ixtla, Morelos, Mexico.

Page 211. After *Algansea tincella* (Cuvier & Valenciennes), insert:

337 (b). **ALGANSEA LACUSTRIS**, Steindachner.

Head 3.67; depth 5; eye 4.75; snout 3.6; interorbital 3. D. III, 7; A. iii, 6; P. 17; V. 9; scales 76–13. Body elongate, strongly compressed behind; caudal peduncle long and slender, its length 5 in head, its depth 10; head pointed, rounded above, greatly increasing in width behind the eyes where the width is half the head's length; mouth slightly oblique, jaws equal; tip of chin slightly thickened; maxillary nearly reaching eye; gape 4 in head; preorbital boat-shaped, concave above, convex below, equal to eye, or 1.6 longer than wide; teeth 4–4, hooked, with compressed crowns. Origin of dorsal midway between anterior border of eye and base of caudal, a little in front of ventrals, whose origin is equally distant between center of eye and base of caudal; height of dorsal 1.75 in head, its base half its height; height of anal 2.14 in head, or twice its base; caudal forked, 1.2 in head, the middle rays not quite half length of longest; ventrals short, 2.17 in head, their tips not reaching vent; pectoral 1.6 in head. Scales firm, half-oval in shape, larger posteriorly; lateral line on middle of side, descending somewhat anteriorly. Color dark brownish gray above, a darker band along middle of side; color below lateral line becoming abruptly lighter gray, merging into silvery on under parts. One example 20 cm. long from Lake Pátzcuaro, Mexico. (Steindachner.)

Algansea lacustris, STEINDACHNER, Einige Fischarten Mex., 10, pl. III, figs. 1–1*b*, 1895, Lake Pátzcuaro, Mexico. (Coll. Princess Theresa von Bayern.)

Page 254. *Orcella*, proposed by us for a subgenus in *Notropis*, is preoccupied by *Orcella*, Gray, 1866, a genus of Cetacea. For our use of it we substitute *Orcula*.

Orcula, JORDAN & EVERMANN, new subgenus in *Notropis* (*orca*).

Page 260. After *Notropis anogenus*, Forbes, insert:

404 (a). NOTROPIS MUSKOKA, Meek.

Head 4; depth 5.5; eye 3.25; snout 3.75; D. 8; scales 36, 10 in series from dorsal to ventral fin; longest dorsal ray 1.34 in head; pectoral 1.5; ventral 2, reaching anal. Teeth 4–4, slightly hooked, grinding surface narrow.

Body rather terete and slender; snout bluntish; mouth small and slightly oblique; lower jaw the shorter, slightly included; posterior end of maxillary scarcely reaching vertical from the front of orbit. Eighteen scales between nape and dorsal fin, the scales in this region being smaller and more crowded than on sides and posterior dorsal region, much resembling *Pimephales notatus* in this respect; lateral line incomplete, not extending beyond the fourth scale on each side. Origin of the first ray of dorsal fin midway between the base of the caudal fin and the tip of the snout; the longest (anterior) dorsal rays nearly three times the length of the posterior ones, the tips of the former extending considerably beyond the tips of the latter when the fin is deflexed. Color olivaceous, darker above, very pale below; a dark band about $\frac{2}{3}$ diameter of eye around snout and on side to base of caudal fin; on the snout this band is confined to the upper jaw; between this band and the darker color on the dorsal region is a lighter band of about the same width; a dark vertebral line present, also a similar one from base of anal to caudal fin. In some specimens the lateral line is absent on the first scales and appears at intervals on about 12 scales, but it is occasionally absent altogether. It is less developed in this species than in any other of the genus.

Close to *N. cayuga*, from which it differs in the reduced size of the scales before the dorsal, the more slender body, the sharper snout, the slightly larger and more oblique mouth, and the more incomplete lateral line. It is also a larger fish than *N. cayuga*.

Known only from Gull Lake, near Muskoka Lake, Ontario, where 24 specimens were obtained by Dr. Meek in September, 1899. They vary in length from 1.31 to 2.91 inches. (Named for Muskoka Lake.)

Notropis muskoka, MEEK, Notes on a Collection of Fishes and Amphibians from Muskoka and Gull Lakes: Publication 41, Field Columbian Museum, Zoological Series, Vol. I, No. 17, 308, November, 1899, Gull Lake, Ontario. (Type, No. 2964, Field Columbian Museum. Coll. Dr. Meek.)

Page 264. After *Notropis procne* (Cope), insert:

412 (a). NOTROPIS RASCONIS, Jordan & Snyder.

Head 4; depth $3\frac{1}{2}$; eye $2\frac{2}{3}$ in head; snout $3\frac{1}{7}$; interorbital space 3; depth of caudal peduncle $2\frac{1}{4}$; height of dorsal $4\frac{1}{7}$ in length; anal 5; length of pectoral $5\frac{1}{2}$; ventral $5\frac{1}{2}$; caudal $3\frac{1}{2}$; D. I, 8; A. I, 8; P. 12; scales 33, 15 between dorsal and occiput, 10 between dorsal and ventral fins. Dorsal outline of body evenly rounded from snout to insertion of dorsal fin, slightly concave from latter point to base of caudal; ventral outline evenly rounded to end of anal base; deepest part of body just anterior to insertion of dorsal; width of body $\frac{1}{7}$ of its length. Snout pointed; mouth

oblique, lower jaw included; maxillary not quite reaching vertical from anterior margin of orbit. Teeth 4–4, frail and easily detached from the arch, slightly hooked, no evident grinding surface; gill-rakers short and blunt, reduced to slight elevations on lower part of first arch. First ray of dorsal fin longest, last ray much shorter; when the fin is elevated, the posterior margin is straight, when depressed, it is somewhat falcate; anal fin similar in shape; pectoral pointed; tips of ventrals reaching anal; caudal deeply forked, the lobes pointed. Color silvery, a dark lateral band, the width of a scale, extending from tip of snout through eye to base of caudal, where it ends in an elongate, black spot; body above lateral band stippled with black, the dots grouped closely together on top of head, and in a narrow dorsal band extending from occiput to insertion of dorsal, in a sharply defined black line along base of dorsal fin, and also on the edges of the dorsal scales; body below dark band immaculate, except a dusky line along base of anal fin; all the fin rays dusky, especially the partly developed caudal rays, which are noticeably darker than the others.

Notropis rasconis is closely related to *N. nigrotæniatus*, from which it differs in having a more compressed body, a longer snout, larger eye, longer and more pointed fins, and in having the color-band narrower on the body and more marked on the snout. (Jordan & Snyder.)

Known only from the Rio Verde near Rascon, San Luis Potosi, Mexico, where the type (No. 6153, L. S. Jr. Univ. Mus.) was collected by J. O. Snyder.

(Named for Rascon, near which place the type was obtained.)

Notropis rasconis, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 121, Rio Verde, near Rascon, Mexico.

Page 302. Before *Ericymba*, Cope, insert:

123 (a). **XYSTROSUS**, Jordan & Snyder.

Xystrosus, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 123 (*popoche*).

Body long, compressed; interorbital space low and flat; mouth terminal, oblique; jaws subequal; premaxillaries protractile; no barbel: no pseudobranchiæ; gill-rakers 6+6, long, slender, crowded on arch; teeth 4–4, hooked, grinding surface oblique, grooved; alimentary canal about twice as long as body; peritoneum dusky; lateral line complete, decurved above pectoral; scales 61, evenly distributed over body; fins falcate; dorsal inserted directly above insertion of ventral; caudal deeply forked; anal basis short. Allied to *Notropis:* differing in the long gill-rakers, the small scales, and the absence of pseudobranchiæ. ξυστρον, (gill-)raker.

498 (a). **XYSTROSUS POPOCHE**, Jordan & Snyder.

Head 3½; depth 4½; eye 4⅔ in head; snout 3⅔; depth of caudal peduncle 2½; height of dorsal 5 in length; anal 6; length of pectoral 6; ventral 6¼; caudal 4; D. 8; A. 7; P. 16; scales 61, 24 between dorsal and occiput, 16 between dorsal and lateral line. Body long and slender; caudal peduncle deep, compressed; head long, its upper contour straight;

interorbital space broad and flat; eye large; its longitudinal diameter contained 2 times in interorbital space; snout sharp, slightly turned up at end; mouth large, oblique; lower jaw included; lips thin; maxillary not quite extending to orbit; gill-rakers 6+6, on first arch, close together, slender, the longest ½ diameter of orbit. Teeth 4–4, strong, hooked, grinding surface oblique, narrow, grooved, a notch just below the hook; alimentary canal almost twice the length of body; peritoneum dusky. Scales not crowded anteriorly, evenly distributed over body; lateral line shaped like the contour of body, except above pectoral fin, where it is sharply decurved; dorsal inserted directly above ventral, first ray highest, nearly 3 times height of last; when depressed, the fin is falcate; when elevated, its edge is concave; anal similar in shape; caudal deeply forked, the tips sharp; ventrals pointed, not reaching vent; pectoral slightly rounded. Color silvery; darker above, especially on median dorsal area, where a more or less dusky band extends the length of the body; rays of dorsal fin and tips of caudal dusky; lower fins white.

Exact measurements of the only specimen obtained are here given: Length of body in millimeters 92; depth of body, expressed in hundredths of length, 23; depth of caudal peduncle 11½; length of head 28½; width of interorbital space 11½; length of snout 8; diameter of orbit 6; distance from snout to dorsal fin 52; height of longest dorsal rays 20; distance from snout to anal fin 73; height of longest anal rays 17; distance from anal to caudal fin 21; length of caudal fin 25; length of pectoral fin 18; distance from snout to ventral fin 53; length of ventral fin 16. (Jordan & Snyder.)

Only the type known (No. 6151, L. S. Jr. Univ. Mus.) collected by J. O. Snyder in Laguna de Chapala, near Ocotlan, Jalisco, Mexico.

Xystrosus popoche, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 123, Laguna de Chapala, Mexico.

123 (b). FALCULA, Jordan & Snyder.

Falcula, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 124 (*chapalæ*).

Body long, compressed; caudal slender; mouth large, lips thin, premaxillaries protractile; no barbel; teeth in 1 row, 4–4, hooked, grinding surface grooved; gill-rakers few, short, far apart; alimentary canal short; peritoneum silvery; lateral line complete; scales rather small, about 50 in lateral series. Fins high, falcate; dorsal inserted directly over ventrals; anal basis short; first simple rays of dorsal and anal rudimentary and closely adnate to first branched ray; caudal long, deeply notched.

The genus *Falcula* is related to *Notropis*, from which it differs in its small scales and in its very high falcate fins. (*falx*, scythe.)

498 (b). FALCULA CHAPALÆ, Jordan & Snyder.

Head 4; depth 4½; eye 3⅜ in head; snout 3⅜; interorbital space 3⅔; depth of caudal peduncle 9½; height of dorsal 4 in length; anal 5; length of pectoral 4⅘; ventral 5¾; caudal 3¼; D. 8; A. 8; P. 17; scales 50, 19 between dorsal and occiput, 16 between dorsal and ventral fins.

Body long, slender, compressed; snout pointed, its length equal to diameter of orbit or to interorbital space; mouth almost horizontal, its cleft extending to vertical from anterior edge of orbit; lips thin; teeth 4–4, strong, slightly hooked, the hook barely evident on lower tooth; three upper teeth with a grooved grinding surface; gill-rakers 3+7, short, pyramidal, and far apart; alimentary canal short; peritoneum silvery; lateral line complete, decurved to a point in a vertical midway between pectoral and ventral fins, from which it extends in a straight line a little below middle of body to the caudal; fins all very high and pointed; dorsal inserted directly over origin of ventrals, falcate when depressed, its first ray longest; anal similar in shape, inserted at a point $\frac{2}{3}$ the distance from tip of snout to base of caudal; ventrals extending to vent, tip of pectoral reaching ventrals; caudal deeply forked. Color silvery; a narrow, dark median band extending down from occiput to base of caudal; dorsal scales with fine dots which give their edges a dusky color.

One specimen known, careful measurements of which are given: Length of body in millimeters 74; depth of body, expressed in hundredths of length, 25; depth of caudal peduncle 11; length of head 25; width of interorbital space 7; length of snout 7; diameter of orbit 7; distance from snout to dorsal fin 47; height of longest dorsal rays 26; distance from snout to anal fin 67; height of longest anal rays 21; distance from anal to caudal fin 27; length of caudal fin $3\frac{1}{2}$; length of pectoral fin 22; distance from snout to ventral fin 62; length of ventral fin 21. (Jordan & Snyder.)

Only the type known (No. 6152, L. S. Jr. Univ. Mus.) collected by J. O. Snyder in Laguna de Chapala, near Ocotlan, Jalisco, Mexico.

(Named for the type locality.)

Falcula chapalæ, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 124, Laguna de Chapala, Mexico.

Page 311. Before *Agosia nubila* (Girard), insert the following:

514 (a). AGOSIA KLAMATHENSIS, Evermann & Meek.

Head 4; depth $4\frac{1}{2}$; eye $4\frac{1}{2}$ in head; snout $3\frac{1}{2}$; D. I, 8; A. I, 7; scales about 14–78–10 (average, 73 in 49 specimens).

Body robust, subcylindrical, back somewhat elevated; snout rather long, mouth inferior, little oblique, the lower jaw included; maxillary not reaching front of orbit; upper lip without frenum; barbel present, but small. Lateral line incomplete, interrupted in many places, about 30 pores developed. Origin of dorsal fin midway between front of pupil and base of caudal fin; pectoral rather short, reaching about three-fourths the distance to base of ventrals; ventrals reaching vent; anal large, its longest ray $1\frac{1}{2}$ in head; caudal widely forked.

Color in alcohol: Olivaceous, mottled and blotched with darker on back and side; under parts pale; an obscure pale streak from eye to base of caudal fin, below which is a broad dark band; dorsal, pectoral, and caudal dusky; other fins plain; a black blotch at base of caudal.

An examination of 48 specimens shows all the important characters to

be fairly constant. The barbel is in a few cases obscure or possibly absent. The number of scales in a transverse line varies from 68 to 78, the average being 73. The lateral line is in all cases incomplete, though in different degrees. Sometimes it is continuous for only 6 or 8 scales, after which there are several interruptions and only 8 to 10 more pores. In others there are 20 to 30 pores in a continuous series.

Close to *A. nubila.*

Upper Klamath Lake, Oregon.

Agosia klamathensis, Evermann & Meek, Bull. U. S. Fish Com. 1897 (Jan. 6, 1898), 74, fig. 5, Pelican Bay, Upper Klamath Lake, Oregon. (Type, No. 48225, U. S. N. M. Coll. Meek & Alexander.)

Page 333. After *Piabucina panamensis*, Gill, insert the following:

552 (a). **PIABUCINA FESTÆ,** Boulenger.

Head $4\frac{1}{8}$; depth 4; eye $4\frac{1}{2}$; snout $4\frac{1}{3}$; interorbital width 9; D. 9; A. 11; scales 28-8; lower jaw longer than snout; teeth 26 above, 32 in external mandibular series; maxillary reaching eye; origin of dorsal equally distant between end of snout and caudal sinus, a little behind base of ventrals; adipose dorsal very small; anal with 8 branched rays; pectoral $1\frac{1}{3}$ in head, longer than ventrals; caudal strongly emarginate, scaled on basal half. Very deep olive brown above, whitish below; fins uniformly gray. Length 160 mm. (Boulenger.) From tributary of Lake Pita, Darien; only the type known. (Named for the collector, Dr. Enrico Festa.)

Piabucina festæ, Boulenger, Bollettino dei Mus. di Zool. ed Anat. Comp. della Univ. de Torino, Vol. xiv, No. 346, April 29, 1899, Rio Sabina, Darien. (Coll. Dr. Enrico Festa.)

Page 367. *Serriromer beanii* has recently been taken by the *Ingolf* at Stations 12 and 20, lat. 64° 38′ N., long. 32° 37′ W., and lat. 58° 20′ N., long. 40° 48′ W., in Denmark Strait and SSE. of Cape Farewell, in 1,040 and 1,695 fathoms, respectively.

Page 398. After *Lycodontis obscuratus* (Poey), insert:

656 (a). **LYCODONTIS JORDANI,** Evermann & Marsh.

Head 7 in total length; depth about 14; eye 8 in head; snout 5; gape 2.2; interorbital a little less than snout. Teeth uniserial, strong, sharp, not close set, all entire and without basal lobes; tail considerably longer than rest of body; gill-opening smaller than eye; snout rather pointed, lower jaw the shorter, the mouth capable of being completely closed. Dorsal fin high, much higher than anal; nasal tube long, about 3 in eye.

Color: Tawny-ochraceous, paler below; upper jaw gray; iris blue; longitudinal brown stripes on side of head in front of gill-opening; head and body covered with numerous small, round, white spots, those on head smallest; a series of larger ones along upper part of side, and 1 or 2 irregular series of large ones on side of belly; between these on the middle of side the spots are smaller; dorsal with an irregular series of small white spots along the base, and another series of about 16 much larger, more quadrate spots of same color along edge of fin, some of the spots cutting the border, which is black; anal similarly spotted and with black

border. In alcohol the general color is grayish black, yellowish below, the tawny-ochraceous or yellow becoming darker, almost black, and the white spots on body becoming yellowish.

This species seems to be related to *L. obscuratus* (Poey), but differs from it markedly in color. Puerto Rico; only the type known, a specimen 15 inches long collected by the U. S. Fish Commission steamer *Fish Hawk* at Mayagüez, January 20, 1899. (Named for David Starr Jordan.)

Lycodontis jordani, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19), 352, Mayagüez, P. R. (Type, No. 49358, U. S. N. M. Coll. Evermann & Marsh.)

Page 447. After *Stolephorus productus* (Poey), insert:

734 (a). STOLEPHORUS GILBERTI, Evermann & Marsh.

Head 3.25; depth 3.4; eye 4; snout 6; maxillary 1.7; mandible 1.7; interorbital 4.9; D. 15; A. 23; pectoral 2.1; ventral 3.5; caudal 1.3; scales 42–9.

Body comparatively deep and strongly compressed, the belly trenchant, without serrations; snout thick, much projecting; maxillary reaching nearly to root of mandible, scarcely serrate; eye moderate; tip of lower jaw reaching vertical from front of eye; distance from lower posterior angle of cheek to vertical from posterior margin of opercle much less than from same point to eye; dorsal inserted far in advance of anal, just behind insertion of ventrals, midway between anterior edge of eye and base of caudal.

Color in spirits: Back light olivaceous with dark punctulations; rest of body below a line from shoulder to upper base of caudal silvery; faint traces of golden behind eye; no lateral band.

This species is very close to *Stolephorus garmani*, Evermann & Marsh, differing chiefly in the much smaller eye, the more uniform color of the back, the somewhat more sharply compressed belly, and the more nearly entire maxillary.

Puerto Rico; only the type, a specimen 4.5 inches long, known. This was collected by the U. S. Fish Commission expedition to Puerto Rico, at Palo Seco, near San Juan, January 13, 1899, associated with *S. productus*. (Named for Dr. Charles Henry Gilbert.)

Stolephorus gilberti, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 352, Palo Seco, P. R. (Type, No. 49359, U. S. N. M. Coll. Evermann & Marsh.)

734 (b.) STOLEPHORUS GARMANI, Evermann & Marsh.

Head 3.2; depth 3.3; eye 3.5; snout 5.5; maxillary 1.7; mandible 1.7; interorbital 5; D. 14; A. 23; pectoral 2; ventral 3.5; caudal 1.3; scales 42–9.

Body comparatively deep and strongly compressed; the belly not strongly trenchant, without serrulations; snout thick, much projecting; maxillary reaching nearly to root of mandible, very finely and weakly serrate; eye large; tip of lower jaw reaching vertical from front of eye; distance from lower posterior angle of cheek to vertical from posterior margin of opercle much less than from same point to eye; dorsal inserted far in advance of anal, just behind insertion of ventrals, midway between anterior edge of pupil and base of caudal.

Color in spirits: Back dark near the median line, below this somewhat reddish; rest of body below a line from shoulder to upper base of caudal silvery; some golden on snout and behind eye; no lateral band.

This species has a general resemblance to *Stolephorus productus*, but is unquestionably distinct from it; the anal is much shorter and inserted farther back, the body is deeper, the eye larger, and the snout longer. It is very close to *Stolephorus gilberti*, Evermann & Marsh, differing chiefly in the larger eye, in the color of the back, and the somewhat less sharply compressed belly.

Puerto Rico; only the type, a specimen 4.5 inches long, known. This was collected by the U. S. Fish Commission expedition to Puerto Rico at Puerto Real, January 27, 1899. (Named for Prof. Samuel Garman, of the Museum of Comparative Zoology.)

Stolephorus garmani, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 352, Puerto Real, P. R. (Type, No. 49360, U. S. N. M. Coll. Evermann & Marsh.)

Page 497. Before *Salmo gairdneri*, Richardson, insert the following:

780 (k). SALMO CLARKII DECLIVIFRONS, Meek.

(Salmon Trout of Lake Southerland.)

Head 3.8; depth 4.6; eye 5.14; snout 4.5; maxillary 1.6; scales 148; D. 10; A. 11; branchiostegals 10; gill-rakers 7 + 10. Body elongate, back elevated, anterior profile much decurved, especially so from nape forward; tip of snout below axis of body; margin of upper lip on a level with lower margin of orbit; gape nearly horizontal, more so than in other trout; maxillary broad, its greatest width 5 in its length, its posterior end reaching beyond eye; dentition strong; posterior margin of dorsal fin straight; tip of second ray reaching middle of last ray in the depressed fin, the last ray 2½ in longest ray; pectoral 1.67 in head; ventral 2.25. Color dark blue above and on side to lateral line anteriorly, and to a short distance above lateral line posteriorly, then becoming abruptly silvery; belly nearly white; no spots on head or body, none on any of the fins, except a few on caudal fin; upper margin of lower jaw black, a dark blue patch on cheek, extending obliquely upward and backward to near top of opercle; pectoral, ventrals, and anal yellowish.

The general color of this species much resembles that of the Blue Back of Lake Crescent. It is some darker, has no spots, except on caudal fin, and the upper anterior profile is much more curved.

Professor Elliot gives the following note on this trout:

"This trout is occasionally taken in Lake Southerland, and is called the 'Salmon Trout.' It is easily recognizable, not only by the sharply curved upper outline of the fore part of the body, but also by its quite different style of coloration, resembling, as stated above, somewhat the style of the Blue Back of Lake Crescent. As there is no water connection between these lakes, and Lake Southerland is 75 feet lower than Crescent, and, moreover, the fish of that lake having no communication with the sea, on account of a very high precipitous fall a short distance from its outlet, it can not be supposed that these two forms are in any way identical. Out

of a large number of trout taken by me in Lake Southerland, only two or three specimens of this form were procured, and they were all of small size, and I did not understand that it was ever obtained of much greater dimensions. This could not be the fault of the lake, which is exceedingly deep, and nearly 3 miles in length. It is a gamey fish, takes the fly, leaps out of water, and is a good fighter for its size." (Meek.)

Length about 10 inches.

Known only from Southerland Lake, Washington, where 2 or 3 specimens (only 1 of which was preserved) were taken by Professor Elliot in 1898. (*declivus*, steep; *frons*, forehead.)

Salmo clarki declivifrons, MEEK, Notes on a collection of cold-blooded Vertebrates from the Olympic Mountains: Field Columbian Museum Publication 31, Zoological Series, Vol. I, No. 12, 230, Feb., 1899, Southerland Lake, Washington. (Type, No. 2006, Field Columbian Museum.)

780 (l). SALMO CLARKII JORDANI, Meek.

(SPOTTED TROUT OF LAKE SOUTHERLAND.)

Head 3.86;* depth 4.79; eye 5.89; snout 4.13; maxillary 1.78; scales 146; D. 10; A. 11; branchiostegals 10 or 11. Body elongate, not much compressed; head short, maxillary rather broad, not extending far behind orbit—its greatest width 4½ in its length, in some specimens about 5½, a slight curve downward under the eye; dentition not so strong as in the Speckled Trout of Lake Crescent; gill-rakers rather long, longer than in the Speckled Trout, but less so than in Blue Back of Lake Crescent; pectoral in head, 1.88; ventral 2.24; origin of dorsal midway between tip of snout and base of caudal, or slightly nearer tip of snout; origin of ventrals under first to third dorsal rays; margin of dorsal fin convex, its base 1.32 in longest ray; snout bluntish. Color in alcohol, dark steel-blue above, paler below, becoming nearly white on the belly; back, sides, and head profusely spotted with black; some specimens with black spots on the belly and on all fins; pectorals and ventrals usually without spots; upper half of lower jaw black, red under dentary bones. The life colors are given by Professor Elliot in the following note:

"This beautiful species is exceedingly gamey, takes a fly readily even as late as October, is a great leaper when hooked, and fights *à l'outrance*. In appearance it resembles *Salmo gairdneri crescentis* of the neighboring lake, being fully as brilliantly colored, but can be at once distinguished by its orange or orange-red fins, red on the jaw, and the number and blackness of its spots, and darker back and top of head. In general appearance there is not the slightest similarity between this species and the specimen from Boulder Creek. At no stage of its existence that I have seen, from fingerlings to fish weighing over 4 pounds, is there any silvery luster, but the colors are all bright-hued, some even metallic. It is one of the most active of its tribe, and I have had them leap after taking the fly in such quick succession, and with such rapid dartings about the lake, that it was impossible to imagine where they would next appear. I be-

*These comparative measurements are the averages of 23 specimens examined by Dr. Meek.

lieve it spawns in the spring, as in the middle of October, when I left Lake Southerland, the eggs of the females we caught were not enlarged, and no indication of the approach of the spawning season." (Meek.)

Length 1 to 2 feet.

Known only from Southerland Lake, Washington, where 23 specimens were collected in 1898 by Professor Elliot.

("Named for Dr. D. S. Jordan, president of Stanford University, who, more than anyone else, has studied our Western trout.") (Meek.)

Salmo clarkii jordani, MEEK, Notes on a collection of cold-blooded Vertebrates from the Olympic Mountains: Field Columbian Museum Publication 31, Zoological Series, Vol. I, No. 12, 229, February, 1899, Southerland Lake, Washington. (Type, No. 2012, Field Columbian Museum.)

Page 500. Before *Salmo irideus*, Gibbons, insert the following:

480 (a). SALMO BATHŒCETOR, Meek.

(LONG-HEADED TROUT OF CRESCENT LAKE.)

Head 3.5 to 3.8; depth 5.10 to 5.75; eye 6.75 to 7.60; snout 3.33; maxillary 1.66; scales 150 to 152; gill-rakers 7 or 8 + 11 to 13; branchiostegals 9 to 11; D. 10; A. 11. Body elongate, slender; head much pointed; anterior margin of upper jaw slightly above axis of the body; maxillary very long and very slender, reaching considerably beyond posterior part of the orbit, its greatest width 7 in its length; about 24 teeth on maxillary; teeth on jaws, vomer, and palatines large, the dentition much stronger than in specimens of *Salmo gairdneri crescentis* of same size; mandible very strong; opercle very broad and contains the eye $1\frac{1}{4}$; preoperculum narrow, less than diameter of the eye; gill-rakers very short and thick; last ray of dorsal less than half longest rays, third ray longer than base of fin; when depressed, second and third ray tips reach beyond middle of last dorsal ray; pectoral $1\frac{3}{4}$ in head; ventrals $2\frac{1}{4}$. Color much as in *S. gairdneri crescentis*, except lighter. Head, body, and tail profusely spotted with black spots; ventrals and pectorals dark. No. 2036 (Field Museum) has fewer spots, none on anal and pectoral; anterior part of upper jaw very dark, darker than in the larger specimen. This species differs from *S. gairdneri crescentis* in being much more slender, its back much less elevated, head more slender and pointed, gill-rakers shorter, maxillary straighter, narrower, and longer. The general color pattern is the same, except that this species is less spotted and lighter. No red on the under jaw; the dentition is much stronger in this species than in *S. gairdneri crescentis*. (Meek.)

Prof. D. G. Elliot gives the following interesting note on this trout:

"This is a deep-water fish, keeping always near the bottom. Lake Crescent is of great depth, in some places over 700 feet, and doubtless much more in others not yet ascertained. The present species, unlike other trout, does not come to the surface, as I was informed, at any season of the year, and will not of course take a fly, or indeed a spoon, or any kind of lure. The only way it can be captured is by set-lines sunk within a foot of the bottom, and it seems that there are only a few places in the lake where it can be caught even by this means. The specimens

obtained were procured at a depth of about 200 feet. While it is a brightly colored fish, it lacks some of the iridescent hues of *S. gairdneri crescentis*, and consequently is less attractive in appearance. It is known as the long-nose, or long-headed trout." (Meek.)

Length nearly 2 feet.

Known only from Crescent Lake, Washington, where two specimens were obtained in 1898 by Prof. D. G. Elliot.

Salmo bathœcetor, MEEK, Notes on a collection of cold-blooded Vertebrates from the Olympic Mountains: Field Columbian Museum Publication 31, Zoological Series, Vol. I, No. 12, 227, February, 1899, Crescent Lake, Washington. (Type, No. 2035, Field Columbian Museum.)

Page 572. *Myctophum gracilis* (Lütken) is reported by Lütken from Denmark Strait, west of Iceland.

Page 583. Before *Farrella*, Goode & Bean, insert the following:

875 (a). CYCLOTHONE MEGALOPS, Lütken.

Together with a great number of *Cyclothone microdon* captured at station 12—64° 38′ lat. N., 32° 37′ long. W., 1,040 fathoms—there occurred a single specimen of a length of 70 mm., habitually looking much like the said species, but differing by the eyes not being particularly small, and by totally wanting the light glands or "photospheres." It can, therefore, apparently, hardly be referred to the same genus. The dorsal and anal fins are very like those of *C. microdon*, though with the difference that the dorsal fin begins somewhat before the anal fin, while this, on the other hand, ends somewhat farther back than the dorsal fin. Quite black. A somewhat larger specimen (105 mm.) from station 9—64° 18′ lat. N., and 27° long. W., 295 fathoms—is so badly preserved that it gives only the information that the eyes are not small and that both jaws are armed with small teeth directed obliquely backward, with a few longer ones in the foremost part of the lower jaw and the foremost part of the palate or the intermaxillary. The nearer determination of this specimen must be reserved for a future discovery.

It seems evident that these specimens belong to species else unknown, but as the material is so scanty I shall limit myself to the short preliminary notes made above. (Lütken.)

Cyclothone (?) megalops, LÜTKEN, Ichth. Results Danish *Ingolf* Exped., Vol. II, 10, 1898, west of Iceland.

Page 617. *Macdonaldia rostrata* was taken in 1895 by the *Ingolf* expedition west of Iceland.

Page 669. After *Characodon variatus*, Bean, insert:

983 (a). CHARACODON ENCAUSTUS, Jordan & Snyder.

Head 4; depth 3⅝; depth of caudal peduncle 8; eye 3 in head; snout 4; interorbital space 3½; height of dorsal 4½ in length; anal 6½; length of pectoral 5½; ventral 6½; caudal 4⅛; D. 16; A. 15; scales 35, 13 transverse series counting upward and forward from origin of anal, 9 on caudal

peduncle. Body deep, compressed, dorsal outline almost straight from snout to origin of dorsal, concave from the latter point to base of caudal; ventral outline evenly curved from snout to posterior part of base of anal; eye very large, nearer snout than to posterior edge of opercle by a distance equal to longitudinal diameter of pupil; mouth small, its width equal to $\frac{2}{3}$ diameter of pupil; maxillary protractile; lower jaw projecting; teeth in 2 series, the outer series small, bicuspid, in a single row, rather firmly attached; inner series minute, in small patches; gill-opening restricted, not extending above base of pectoral fin; gill-rakers slender, equal in length to $\frac{1}{2}$ diameter of pupil. Alimentary canal short; air-bladder large, extending posteriorly to a point above origin of anal; dorsal fin inserted halfway between tip of snout and base of caudal, length of base a little less than height of fin; anal inserted below middle of dorsal, its edge rounded; pectoral extending to base of ventrals; ventrals extending to vent. Scales on body large; upper posterior part of head and a narrow space below and posterior to eye with scales; other parts of head naked; small scales on basal part of caudal fin; a row of large pores above eye and at lower edge of suborbital patch of scales; no lateral line. Color in alcohol light, yellowish olive; 9 short and narrow vertical bands on median part of body, the first above base of pectoral, the ninth at base of caudal; scales on dorsal region of body edged with black dots; upper part of head dark; upper half of orbit black; opercles silvery; dorsal fin with a little dusky; other fins without dark color.

This species somewhat resembles *C. eiseni* in appearance. It differs in having more rays in the dorsal and anal fins, smaller scales, a more compressed body, and less dark color on the body. (Jordan & Snyder.)

Known only from Laguna de Chapala, near Ocotlan, Jalisco, Mexico, where J. O. Snyder collected the type, a female, No. 6163, L. S. Jr. Univ. Mus. (*ενκαυστός*, branded.)

Characodon encaustus, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 126, Laguna de Chapala, Mexico.

Page 685. After *Goodea atripinnis*, Jordan, insert:

313 (a). XENENDUM, Jordan & Snyder.

Xenendum, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 127 (*caliente*).

Body deep, not much compressed; males and females of about the same size. Eye normal; mouth vertical, lower jaw projecting; teeth loosely attached, in 2 series, the first series flat, bicuspid, in 2 or 3 rows on each jaw; the second series minute, in villiform bands, sometimes absent; gill opening not restricted, extending above the pectoral fin a distance equal to the diameter of pupil. Alimentary canal long, with many convolutions; air-bladder present, large. Scales large; no lateral line. Dorsal and anal inserted posteriorly, the one directly over the other, their bases short; anal very slightly modified in male, first rays shorter, edge double-convex—the notch being between smaller and larger groups of rays; ventral fins present; caudal rounded, and not modified in male.

Xenendum differs notably from *Characodon* in having the bicuspid teeth loosely attached and in more than one series. *Characodon* has the bicuspid

teeth firmly attached and in a single series. Its actual affinities are with the genus *Goodea*, and it belongs to the subfamily *Goodeinæ*, which has the general characters of the *Pœciliinæ*, but with bifurcate or trifurcate teeth, and no great differences between the sexes. (ξενός, strange; ἐνδόν, within.)

1008 (b). XENENDUM CALIENTE, Jordan & Snyder.

Head $3\frac{3}{4}$; depth $2\frac{2}{3}$; depth of caudal peduncle $5\frac{2}{3}$; eye 4 in head; snout $3\frac{1}{3}$; interorbital space 2; height of dorsal $5\frac{2}{3}$ in length; anal $6\frac{2}{3}$; length of pectoral 5; ventral $7\frac{2}{3}$; caudal 5; D. 13; A. 14; scales 36, in transverse series counting upward and forward from origin of anal, 14; on caudal peduncle, 9. Body large and thick set, deepest at tip of pectoral; width $4\frac{4}{5}$ times in length; head pointed; interorbital space broad, slightly convex; length of snout about equal to diameter of orbit; mouth vertical, its width equal to length of snout; maxillary very protractile; teeth loosely attached, in 2 series, those of the first series larger, flat, and notched, in 2 rows on upper jaw, 3 rows on lower, the individual teeth of each row alternating in position with those of the next, those of the second series very minute, in a villiform band; gill-opening not restricted, extending above the pectoral a distance equal to diameter of pupil; gill-rakers long, slender, and close together, 40 on first arch. Alimentary canal long (in one specimen $4\frac{1}{2}$ times the length of body), coiled many times; peritoneum black; genital opening close to base of anal, covered by a thick, notched pad. Dorsal fin inserted posteriorly, rounded, the base short, its length less than height of fin; anal inserted under dorsal, first 5 rays crowded together and shortened; edge of fin double-convex, the notch being between the shorter and longer sets of rays; pectorals and ventrals with rounded edges; caudal evenly rounded; body and head everywhere, except jaws and preorbital area, with scales; no lateral line. Color light olive, growing darker above; medium dorsal area blackish, each scale with a dark, angular band, those of the sixth series below the dorsal darker, making an indistinct, narrow lateral band; all the fins, except ventrals, dusky.

The females differ but slightly from the males. The body is more thick set, the caudal peduncle a little less deep, the fins a little lower, and the anal evenly rounded. The young are somewhat mottled in color.

Xenendum caliente differs from *X. luitpoldii* in having fewer scales in the lateral and transverse series and on the caudal peduncle, and in a similar way from *X. xaliscone*, besides having villiform teeth, which are absent in *X. xaliscone*. (Jordan & Snyder.)

Known only from Rio Verde, near Aguas Calientes, Mexico. (Type, a female, No. 6147, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Xenendum caliente, JORDAN & SNYDER, Bull U. S. Fish Com. 1899 (1900), 127, Rio Verde, near Aguas Calientes, Mexico.

Characodon luitpoldii, Steindachner (p. 2832) belongs to this new genus, and should stand as

1008 (b). XENENDUM LUITPOLDII (Steindachner).

1008 (c). XENENDUM XALISCONE, Jordan & Snyder.

Head $4\frac{2}{3}$; depth $3\frac{1}{3}$; depth of caudal peduncle $6\frac{1}{2}$; eye $3\frac{1}{4}$ in head; snout 3; interorbital space $1\frac{2}{3}$; height of dorsal $6\frac{1}{2}$ in length; anal 9; length of pectoral $5\frac{1}{4}$; ventral $7\frac{1}{2}$; caudal 5; D. 13; A. 14; scales 42, transverse series, counting upward and forward from origin of anal, 17; on caudal peduncle 12. Body thick set, deepest at origin of ventrals, widest at bases of pectorals; caudal peduncle deep and long; head large and pointed; interorbital space broad, slightly convex; mouth vertical, its width equal to length of snout; maxillary very protractile; teeth loosely attached, broader at distal ends than at bases, bicuspid, in two rows on each jaw; no villiform teeth present; gill openings extending above base of pectorals a distance about equal to diameter of pupil; gill-rakers long, flat, very close together, 56 on first arch. Alimentary canal long, in many folds; peritoneum black. Dorsal fin inserted posteriorly, first ray simple, closely attached to second; edge of fin rounded; anal inserted on a vertical passing through the base of fourth dorsal ray, similar to dorsal in shape; pectoral and ventral fins rounded; edge of caudal a little convex; basal fourth with scales. Scales large, everywhere on body and head, except lower jaw and preorbital area; no lateral line. Color plain, dark above, light below, the dark color leaving off rather abruptly on the head along a line passing through lower edge of eye; on the body, along a line passing from lower edge of base of pectoral to caudal, leaving lower one-fifth of caudal peduncle light; faint traces of a dark spot at base of each scale on dorsal region of body; all the fins, except ventrals, dusky. Laguna de Chapala, Mexico.

One male individual was taken. It resembles the female in general appearance. The anal fin is not advanced nor modified into an intromittent organ. Although it is injured, it shows that the first 5 or 6 rays were close together and shortened.

Xenendum xaliscone differs from *X. caliente* in not having villiform teeth, in having more scales in the lateral and transverse series, and on the caudal peduncle. It differs from *X. huitpoldii* (Steindachner), which is the third known species of the genus, in having a much longer snout, a more pointed head, and in not having villiform teeth. (Jordan & Snyder.)

Known only from Laguna de Chapala, near Ocotlan, Jalisco, Mexico. (Type, a female, No. 6148, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

(Name from Jalisco, the type locality.)

Xenendum xaliscone, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 129, Laguna de Chapala, Mexico.

Page 698. Before *Mollienisia*, Le Sueur, insert:

1037 (a). POECILIA LIMANTOURI, Jordan & Snyder.

Head $3\frac{1}{2}$ in length; depth 3; depth of caudal peduncle $4\frac{2}{3}$; eye $3\frac{1}{2}$ in head; snout 3; interorbital space 2; height of dorsal $5\frac{1}{2}$ in length; anal $4\frac{1}{2}$; length of pectoral $4\frac{1}{2}$; ventral 6; caudal $3\frac{1}{2}$; D. 9; A. 8; scales 26–9, 8 on caudal peduncle. Body rather deep and compressed; dorsal outline angular, its highest point at insertion of dorsal; lowest point of

ventral outline at base of ventrals. Head pointed, interorbital space wide and flat; eye large, nearer tip of snout than to posterior edge of opercle by a distance equal to diameter of pupil; mouth very oblique, its width equal to 2 times diameter of pupil; premaxillaries protractile; distal end of maxillary visible; lower jaw projecting; teeth in two series on each jaw, the outer series in a single row, small, pointed, loosely attached; second series scarcely discernible, in bands; gill-openings extending above base of pectoral a distance equal to ½ diameter of orbit; gill-rakers on first arch 20, small and slender; alimentary canal very long and slender. Body and entire head, except preorbital area, lips, and lower jaw, covered with large scales; 3 rows of scales on base of caudal; small scales extending on inter-radial membranes of caudal, a distance beyond the basal scales about equal to diameter of the eye. Dorsal fin inserted halfway between base of caudal and anterior edge of pupil, its base contained 6⅔ times in length of head and body, its height 5⅔, the last rays a little higher than the first; anal advanced close to base of ventrals, the first and second rays short, closely attached to the next, third ray greatly enlarged and lengthened, a loosely attached ovate, fleshy pad near its tip; fourth and fifth rays slender, as long as third; tips of third and fifth rays bent toward that of the fourth; sixth to eighth rays about ½ as long as third; caudal rounded, its length contained 3⅓ times in head and body; pectoral rounded, the length contained 1¼ times in head; ventrals pointed, extending to middle of longest anal ray. Color in alcohol, light yellowish olive, much lighter on breast and ventral part of head; posterior edges of scales dark; lower jaw, preorbital area, upper part of head, and a narrow, median dorsal stripe, dark; basal ⅔ of dorsal fin black, distal part of fin white, the boundary between the white and black more definite on the anterior than on posterior part of fin; basal ⅔ of caudal dusky, distal part without color.

Other male examples have only a few small dark spots on dorsal and caudal. The females have the body more elongate than the males, the depth of the caudal peduncle 5⅔ in length. The dorsal fin is inserted in advance of the anal, its origin above anal opening, the first rays highest. The ventrals extend to the posterior edge of the vent, but do not reach the anal. The dorsal and caudal have a little dusky coloring.

Lack of material for comparison prevents our commenting on the probable affinities between this and other species of the genus. (Jordan & Snyder.)

Known only from Rio Tamesoe, near Tampico, Tamaulipas, Mexico, where several specimens were collected January 12, 1899, by Mr. Snyder. (Type, a female, No. 6165, L. S. Jr. Univ. Mus.)

(Named for Jose Limantour, the accomplished minister of the "Hacienda" in Mexico.)

Pœcilia limantouri, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 129, Rio Tamesoe, near Tampico, Mexico.

Page 702. Before *Xiphophorus guntheri*, Jordan & Evermann, insert:

1043 (a). XIPHOPHORUS MONTEZUMÆ, Jordan & Snyder.

Head 4⅓; depth 3; depth of caudal peduncle 4⅔; eye 3¼ in head; snout 3¼; interorbital space 2; height of dorsal 3½ in length; anal 5; length of

pectoral $4\frac{1}{5}$; ventral $4\frac{1}{2}$; upper rays of caudal $3\frac{1}{3}$, lower rays $1\frac{1}{10}$; D. 13; A. 7; scales 29-9, 7 on caudal peduncle. Body deep, compressed, dorsal contour arched, its highest point at insertion of dorsal; caudal peduncle narrow and very deep; head small, pointed; interorbital space wide, slightly convex; eye large, a little nearer tip of snout than to posterior edge of opercle; mouth vertical; teeth in two series, the first in a single row, minute, flat, and pointed, the second in a villiform band, much smaller and narrower than the first, brownish-colored, strongly curved backward; gill opening extending above base of pectoral a distance equal to diameter of pupil; gill-rakers on first arch 19, slender, the length of longest equal to half diameter of eye; intestinal tract slender and long; peritoneum black; scales on head and body large, 1 large, round scale on interorbital space, followed by 2, a row of 11 from the latter to first dorsal ray; 3 rows on base of caudal fin; base of dorsal fin short, $4\frac{1}{5}$ in body, first ray shortest, the others graduated to the eighth, which is longest; ninth, tenth, and eleventh shorter; twelfth and thirteenth longer; the abrupt shortening of the ninth, tenth, and eleventh rays makes a notch in the outline of fin; anal advanced, its origin under third ray of dorsal; first ray greatly enlarged and lengthened; second and third equally lengthened, but more slender, these three with their connecting membranes forming a half tube with a pointed end; other rays half the length of first; upper lobe of caudal rounded, 5 lower rays forming a very long, blunt appendage; ventrals pointed, extending almost to tip of anal; pectoral sharply rounded; color yellowish olive, marked with black; during life there were 4 narrow, longitudinal orange bands, each extending along a row of scales on body; top of head, and a median dorsal band extending to caudal, dusky; a narrow, dusky band on edge of lower jaw; 2 short, vertical bands on snout; 6 upper rows of scales edged with black or dusky; a few black spots irregularly arranged on body above ventrals; a large black spot at base of caudal, its color extending along upper edge of prolongation; a dark line extending along lower edge of caudal peduncle to end of lower caudal rays, the caudal extension with a light central portion bordered with black, the lower border wider; underpart of head and belly without dark color; dorsal fin with black dots and lines; pectorals, ventrals, and anal plain.

Considerable variation in shape of fins and in color is shown among other male examples (cotypes, males and females, No. 6146, L. S. Jr. Univ. Mus.). In some the fins are low and short, the caudal ornament represented only by a slight lengthening of the lower rays. Among individuals, apparently fully grown, there is every graduation from the undeveloped to the very long caudal extension. In every case the scales are conspicuously dark edged. In some examples black spots, crowded together, form a more or less dark line from eye to caudal, while below this line are large, irregular black blotches. Others have no black spots, and the dark caudal patch has almost disappeared.

The females have the fins low or short, and without special modifications, the posterior edge of caudal C-shaped, the upper part rounded, the lower pointed, the scales dark edged; a narrow, indefinite, dark color band usually present along median line of sides; the dark caudal patch

rarely absent. Fully grown males are scarce, a large catch consisting mostly of females and young.

Xiphophorus montezumæ is distinguished from the other known species of the genus by having 7 anal rays, the scales with conspicuous dark edges, a large brown caudal spot, and the caudal appendage not sword-shaped, but with its end enlarged and blunt. (Jordan & Snyder.)

Known only from Rio Verde, near Rascon, San Luis Potosi, Mexico. (Type, a male, No. 6145, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Xiphophorus montezumæ, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 131, Rio Verde, near Rascon, Mexico.

Page 702. The recent studies of the eyes of American blind fishes by Dr. C. H. Eigenmann have shown that the species occurring in the caves of southwestern Missouri which has usually been identified as *Typhlichthys subterraneus*, Girard, but which Dr. Eigenmann described as a new species under the name *Typhlichthys rosæ* (p. 2835), has had an ancestry quite distinct from that of *Typhlichthys*. It therefore is generically distinct from *Typhlichthys*, and has been made the type of the new genus *Troglichthys* by Eigenmann.

322 (a). TROGLICHTHYS, Eigenmann.

Troglichthys, EIGENMANN, Science, N. S., Vol. IX, No. 217, p. 282, Feb. 24, 1899 (*rosæ*).

Scleral cartilages present, pigment in the pigment epithelium; vitreal cavity obliterated, no hyaloid membrane; pupil closed, some of the eye muscles developed; no outer reticular layer; outer and inner nuclear layers merged into one; eye in adult not connected with the brain; pigment epithelium developed on the distal face of the eye, rarely over the sides and back; no cones; nuclear layers mere vestiges; ganglionic layer restricted to the anterior face of the eye just within the pigmented epithelium. Maximum diameter of eye about 85μ. No ventral fins. ($\Tau\rho\omega\gamma\lambda\eta$, cavern; $\iota\chi\theta\acute{\upsilon}\varsigma$, fish.)

The genera and species of Amblyopsidæ may be determined by the following key (from Eigenmann), based largely on the character of the eyes:

a. Vitreous body and lens normal, the eye functional; no scleral cartilages; eye permanently connected with the brain by the optic nerve; eye muscles normal; no optic fiber layer. Minimum diameter of the eye 0.700μ. No ventral fins. CHOLOGASTER, 321.

b. Eye in adult more than 1 mm. in longitudinal diameter; lens over 0.5 mm. in diameter; retina very simple, its maximum thickness 83.5μ in the old; the outer and inner nuclear layers consisting of a single series of cells each; the ganglionic layer of isolated cells. Maximum thickness of the outer nuclear layer 5μ, of the inner nuclear layer 8μ. CORNUTUS, 1044.

bb. Eye in adult less than 1 mm. in longitudinal diameter; lens less than 4 mm.; outer nuclear layer composed of at least 2 layers of cells; inner nuclear layer of at least 3 layers of cells, the former at least 10μ thick, the latter at least 18μ.

c. Pigment epithelium 65μ thick in the middle-aged, 102μ in the old. PAPILLIFERUS, 1046.

cc. Pigment 49μ thick in the middle-aged, 74μ in the old; 24 to 30 per cent thinner than in papilliferus; eye smaller. AGASSIZII, 1045.

aa. The eye a vestige, not functional; vitreous body and lens mere vestiges, the eye collapsed, the inner faces of the retina in contact. Maximum diameter of eye about 200μ.

d. No scleral cartilages, no pigment in the pigment epithelium; a minute vitreal cavity; hyaloid membrane with blood vessels; pupil not closed; outer nuclear, outer reticular, inner nuclear, inner reticular, ganglionic, and pigment epithelial layers differentiated; cones probably none; no eye muscles. Maximum diameter of eye 180μ. Eye probably connected with brain throughout life. TYPHLICHTHYS, 322.

dd. Scleral cartilages present; pigment in the pigment epithelium; vitreal cavity obliterated, no hyaloid membrane; pupil closed; some of the eye muscles developed; no outer reticular layer; outer and inner nuclear layers merged into one. Eye in adult not connected with the brain.

e. Pigment epithelium well developed; cones well developed; ganglionic cells forming a funnel-shaped mass through the center of the eye; pigmented epithelium over the front of the eye without pigment. Maximum diameter of eye about 200μ. Ventral fins present. AMBLYOPSIS, 323.

ee. Pigment epithelium developed over the distal face of the eye, rarely over the sides and back; no cones; nuclear layers mere vestiges; the ganglionic layer restricted to the anterior face of the eye, just within the pigmented epithelium. Maximum diameter of the eye about 85μ. No ventral fins. TROGLICHTHYS, 322 (a).

Page 744. To the synonymy of *Eucalia inconstans* (Kirtland), add the following:

Gasterosteus gymnetes, DAWSON, Canadian Naturalist, Vol. IV, No. 5, October, 1859, 321-324, figs. 1-3, Montreal, Canada. (Coll. Prof. J. W. Dawson.)

Page 789. Recent investigations made by Dr. Jordan in certain fresh-water streams and lakes of Mexico resulted in the discovery of several new species of Atherinidæ and new facts regarding other species:

1157. ESLOPSARUM JORDANI (Woolman).

Locality, Rio Verde, Aguas Calientes, Mexico.

Two specimens of *Eslopsarum jordani* were collected, together with numerous individuals of *E. arge*. *Chirostoma breve*, Steindachner, is probably identical with *E. jordani*, as already supposed by us.

An examination of a number of species of *Eslopsarum* and of *Chirostoma* shows that the number of vertebræ, in addition to the character of the scales, furnishes a distinguishing generic feature.

Species.	Vertebræ.
Eslopsarum jordani	38
arge	37
Chirostoma humboldtianum	44
chapalæ	45
promelas	45
diazi	44
crystallinum	44
lermæ	44
ocotlane	44

Chirostoma contains two very marked types of species. The one represented by the typical species, *Chirostoma humboldtianum*, has the flesh firm

and opaque in life. The other (*Lethostole*), typified by *Chirostoma estor*, has the flesh thin, translucent, and very pale. There are correlated differences in the firmness of the bones and scales, but thus far we have found no tangible character on which to separate *Lethostole* as a genus from *Chirostoma*. The known species of *Lethostole* are *estor, album, chapalæ, grandocule, promelas, diazi, crystallinum, lermæ,* and *ocotlane.*

1157 (a). ESLOPSARUM ARGE, Jordan & Snyder.

Head 4¼; depth 4⅛; depth of caudal peduncle 2¾ in head; eye 3⅜; snout 3; interorbital space 3½; height of spinous dorsal 3⅛; soft dorsal 2; anal 2; length of pectoral 1½; ventrals 2½; caudal 1⅓; D. IV–8; A. 15; P. 13; scales 40–11, 5 between the dorsals. Body rather thickset, its deepest part just anterior to base of ventrals; width of body equal to distance from posterior edge of orbit to tip of snout; eye nearer to tip of snout than to posterior edge of opercle by a distance equal to diameter of pupil; interorbital space convex; width of preorbital area equal to diameter of pupil; tip of lower jaw projecting beyond that of upper; mouth large, oblique; lips not much thickened posteriorly, the lower not distinctly folded over the upper at their angle; maxillary extending posteriorly to a perpendicular passing through anterior edge of orbit, its distal end below the level of eye; teeth large, sharp, projecting backwards, in 2 definite rows on each jaw, none on vomer or palatines; gill-rakers on first arch 14, long and slender; air-bladder extending posteriorly to a point a little past insertion of anal; peritoneum black; vertebræ 37. Lateral line represented on the fifth row of scales below the dorsal by a series of partly developed pores; scales large, entire, covering head and body except snout, lower jaw, preorbital area, and a small space around base of pectoral; small scales extending for a short distance on interradial membranes of caudal; first 3 dorsal spines of about the same height, the fourth shorter; first dorsal ray longest, the others gradually shorter; edge of fin straight; anal inserted on a perpendicular, passing halfway between dorsals, its first ray longest; edge of fin slightly concave; caudal notched, the tips and notch rounded, extending to bases of ventrals; ventrals falling short of vent a distance equal to diameter of orbit. Color in life, translucent; a silvery lateral band with its upper edge dark, extending from upper part of base of pectoral to base of caudal, the band less distinct in the region of the pectoral fin; scales of back edged with fine, dark specks; snout, lower jaw, top of head, and upper part of eye dusky; dorsal and caudal fins with a little dusky coloring.

Specimens of *E. arge* were caught in the same seine-haul with *E. jordani*. The former species differs from the latter in having a thicker body, a longer snout, a larger and less oblique mouth, a larger eye, and a wider color band.

In the drawing accompanying the original description of *Eslopsarum jordani* the mouth is wrongly represented. Of the specimens examined, including some of the types, the mouth is much like that of *Chirostoma humboldtianum*. The cleft is not straight in outline. The lower lip folds over the upper at their union. (Jordan & Snyder.) (*arge*, silvery.)

Known only from the Rio Verde, near Aguas Calientes, Mexico. (Type, No. 6154, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Eslopsarum arge, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 133, Rio Verde, near Aguas Calientes, Mexico.

1157 (b). CHIROSTOMA CHAPALÆ, Jordan & Snyder.

Head 4; depth $5\frac{1}{2}$; depth of caudal peduncle 3 in head; eye $3\frac{2}{3}$; snout $3\frac{1}{3}$; interorbital space 4; height of spinous dorsal 3; soft dorsal $1\frac{2}{3}$; anal $1\frac{2}{3}$; length of pectoral $1\frac{1}{4}$; ventrals $2\frac{1}{3}$; caudal $\frac{9}{10}$; D. IV–10; A. 20; pectoral 14; scales 47–13, 6 between dorsals. Body slender, compressed, its deepest part below first dorsal; eye large, nearer tip of snout than to posterior edge of opercle by a distance equal to $1\frac{1}{2}$ times the diameter of pupil; interorbital space convex, its width about equal to diameter of pupil or to preorbital area; symphysis of lower jaw projecting a little beyond tip of upper, the lips meeting; mouth oblique, lips thickened posteriorly, the lower folding over the upper at their union; angle of mouth on a level with center of pupil; maxillary nearly vertical, its distal end in advance of a vertical from anterior edge of orbit, a distance equal to $\frac{2}{3}$ the diameter of pupil. Teeth minute, in bands, not arranged in definite rows; no teeth on vomer or palatines; gill-rakers on first arch 30, very slender, the length of longest equal to diameter of orbit; peritoneum black; air-bladder very large, extending posteriorly to a point above middle of anal fin; vertebræ 45. A well-defined lateral line extending along the body on the eighth row of scales below the first dorsal. Scales large, crenate, not notably reduced in size nor closely crowded together on any part of the body; those on post-occipital region and anterior to pectorals small; scales extending on basal $\frac{2}{3}$ of inter-radial membranes of caudal; lower jaw, snout, and preorbital space naked; first 2 spines of dorsal highest, the following 2 a little shorter; first ray of second dorsal highest, others gradually shorter; anal inserted a little anterior to a perpendicular passing halfway between the origins of dorsals, first ray longest, others successively shorter; when the fin is elevated, its edge is concave; caudal deeply forked, the tips pointed; pectoral notably pointed, extending past base of ventral a distance equal to diameter of orbit; ventrals extending to vent. Color in life, translucent; a silvery lateral band 1 scale wide, bright, and distinct posteriorly, becoming indistinct anteriorly; upper edge of lateral band with dusky; scales on dorsal part of body edged with dark dots; upper and lower jaws with dark dots; upper part of eye black, the dark, pigmented arachnoid showing through the thin skull. (Jordan & Snyder.)

C. chapalæ is closely related to *C. grandocule*, Steindachner. It differs in having a smaller eye and larger scales. The former has 44 to 51 scales in the lateral series, and 12 to 14 in a transverse series, while *C. grandocule* has 60 to 62 scales in the lateral series and 15 or 16 in a transverse series.

Known only from Laguna de Chapala, near Ocotlan, Jalisco, Mexico. (Type, No. 6165, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Chirostoma chapalæ, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 135, Laguna de Chapala, Mexico.

1157 (c). CHIROSTOMA PROMELAS, Jordan & Snyder.

Head $3\frac{2}{5}$; depth $4\frac{2}{5}$; depth of caudal peduncle $3\frac{1}{3}$ in head; eye $5\frac{2}{3}$; snout $2\frac{1}{2}$; interorbital space $4\frac{1}{2}$; height of spinous dorsal $3\frac{2}{3}$; soft dorsal $2\frac{2}{5}$; anal 2; length of pectoral $1\frac{2}{3}$; ventral $2\frac{1}{2}$; caudal $1\frac{1}{2}$; D. IV–11; A. 19; pectoral 15; scales 53–16, 9 between dorsals. Head slender, triangular; eye small, nearer tip of snout than to edge of opercle by a distance equal to half diameter of pupil; width of preorbital area somewhat greater than diameter of pupil; interorbital space slightly convex; snout pointed; upper jaw projecting a little beyond the lower; cleft of mouth almost horizontal; lips enlarged posteriorly, the lower lip folding over the upper at their junction; angle of mouth on a level with lower part of pupil; maxillary almost vertical in position, its distal end not extending backward as far as anterior edge of orbit; teeth large, curved inward, not arranged in definite rows; none on vomer or palatines; vertebræ 45. A tolerably well-defined lateral line extending along the body about 8 scales below the first dorsal, the pores absent on some of the scales; scales crenate, largest along lateral color band; a post-occipital patch of minute, closely-crowded scales extending backward nearly to a line connecting bases of pectorals; a narrow band of similar scales just posterior to gill-openings, and on base of caudal, the latter extending on inter-radial membranes half their length; scales between dorsals not abruptly smaller than those near by, nor crowded closely together; head with scales except on snout, preorbital region, and on lower jaw; first 3 spines of dorsal nearly equal in length, the fourth a little shorter; first dorsal ray longest, the others gradually shorter; anal inserted on a perpendicular passing midway between dorsals, first ray longest, others successively shorter; edge of fin slightly concave; pectoral pointed; extending beyond base of ventrals a distance equal to diameter of pupil; ventrals not quite reaching vent. Color in alcohol, yellowish olive; a distinct silvery lateral band, the light color of which is underlaid with dark pigment, extending from upper part of base of pectoral to caudal, wider and brighter in color between dorsal and anal, growing narrower on caudal peduncle, widening at its end; scales of upper part of body with dusky coloring on their edges; dorsals, pectoral, and caudal with dark color; eye dusky above, a dark band on interorbital space; snout and jaws black.

Chirostoma promelas is distinguishable from other known species of the genus by the projecting upper jaw and the black snout.

One specimen other than the type was obtained. In it the projection of the upper jaw is more pronounced than in the type. The gill-rakers and abdominal viscera had been removed from both. (Jordan & Snyder.)

Known only from Guadalajara, Jalisco, Mexico, where 2 specimens were obtained in the market. (Type, No. 6156, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.) (*πρό*, before; *μελάς*, black.)

Chirostoma promelas, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 136, Guadalajara, Mexico.

1157 (d). CHIROSTOMA DIAZI, Jordan & Snyder.

Head $3\frac{1}{3}$; depth 5; depth of caudal peduncle $3\frac{1}{4}$ in head; eye $5\frac{1}{3}$; snout $2\frac{1}{2}$; interorbital space $4\frac{1}{3}$; height of spinous dorsal $4\frac{2}{3}$; soft dorsal $2\frac{1}{2}$; anal $2\frac{2}{3}$; length of pectoral $1\frac{2}{3}$; ventral 3; caudal $1\frac{2}{3}$; D. V–11; A. 20; P. 15; scales 69–20, 22 between dorsals. Body long, deeper and more compressed than that of *C. humboldtianum;* head large, its dorsal contour straight from tip of snout to occiput; viewed from above, the head is much compressed, the upper jaw is sharply pointed and included by the lower; interorbital space slightly convex; eye nearer tip of snout than to edge of opercle by a distance equal to diameter of pupil; preorbital area a little wider than diameter of orbit; mouth oblique, its cleft extending to a horizontal from lower edge of orbit; lips thickened posteriorly, the lower forming a fold across the upper at angle of mouth; lower jaw projecting, the teeth just passing the edge of the upper; maxillary extending to a vertical from anterior edge of orbit, its distal end angular; teeth large anteriorly, growing gradually smaller posteriorly, canine-like, sharp, projecting backward, not arranged in definite rows, none on vomer or palatines; vertebræ 41. Scales crenate, larger in region of lateral color band, growing smaller dorsally and ventrally, abruptly smaller and closely crowded together in a region anterior to the pectoral fin, extending from the isthmus to the occiput, also between the dorsal fins and along bases of dorsals, anal and caudal; inter-radial membranes of the latter with scales extending $\frac{2}{3}$ its length; head with scales except on jaws, upper part of snout, and on preorbital area; two anterior spines of dorsal longest, others a little shorter; first dorsal ray longest, others gradually shorter; anal similar to soft dorsal in shape, except that its base is much longer; insertion of anal on a perpendicular passing halfway between dorsals; caudal deeply forked, the lobes pointed; pectoral sharp, extending past base of ventrals a distance equal to diameter of orbit; edge of pectoral, when extended, straight. Body, during life, translucent; in alcohol, greenish olive; a silvery lateral band, in which the silver is not underlaid with black pigment, extending from axil to base of caudal; dorsal scales narrowly edged with dusky; upper part of eye dark. Jalisco, Mexico.

Our specimens are all from the market at Guadalajara. The gill-arches and viscera had been removed. The flesh is somewhat shrunken, which probably causes the teeth to appear more prominent than in life.

Chirostoma diazi may be easily distinguished from the other known species of the genus by the small scales crowded closely together between the dorsal fins. (Jordan & Snyder.)

Known only from the market at Guadalajara, Jalisco, Mexico. (Type, No. 6157, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

(Named for Porfirio Diaz, the honored President of the Republic of Mexico, in recognition of his interest in the progress of science.)

Chirostoma diazi, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 137, Guadalajara, Mexico.

1157 (e). **CHIROSTOMA CRYSTALLINUM**, Jordan & Snyder.

Head $3\frac{1}{4}$; depth $4\frac{2}{4}$; depth of caudal peduncle $3\frac{1}{2}$ in head; eye $5\frac{2}{4}$; snout $2\frac{3}{5}$; interorbital space $4\frac{1}{2}$; height of spinous dorsal $4\frac{1}{2}$; soft dorsal $2\frac{1}{2}$; anal $2\frac{1}{4}$; length of pectoral $1\frac{1}{3}$; ventral $2\frac{3}{4}$; caudal $1\frac{3}{4}$; D. V–13; A. 24; P. 15; scales 56–18, 10 between dorsals. Body deepest above ventrals, widest at insertion of pectorals; head long and pointed, its upper contour straight; snout, viewed from above, sharply pointed, the lower jaw projecting beyond upper a distance equal to not more than half diameter of orbit; eye nearer tip of snout than to posterior edge of opercle a distance equal to diameter of pupil; mouth oblique, the cleft extending downward to a level with lower edge of pupil; lips thickened posteriorly, the lower folding over the upper at angle of mouth; teeth minute, in wide patches, not arranged in definite rows, on upper and lower jaws; no teeth on vomer or palatines; gill-rakers on first arch 27, slender, the length of longest equal to diameter of pupil; vertebræ 44. An indefinite lateral line extending along the body about 9 scales below first dorsal, the pores absent on many of the scales; scales crenate, largest along color-band, growing smaller above and below, much smaller and closely crowded on the body anterior to the pectoral fin, from the isthmus to the occiput; a few small scales at upper end of opercle, along bases of fins, and on the inter-radial membranes of caudal for half its length; scales between dorsals large and not crowded together; lower jaw and upper part of snout naked; first 3 spines of dorsal about the same length, reaching, when depressed, to $\frac{1}{3}$ their length of insertion of soft dorsal; first dorsal ray longest, others gradually shorter; anal inserted on a perpendicular passing through a point half way between origins of dorsals, base much longer than that of dorsal; first dorsal ray longest, others gradually shorter to middle of fin, all remaining rays of about the same height; caudal deeply forked, the tips rounded; pectoral pointed, extending a little past base of ventrals; tips of ventrals extending to vent. Body, during life, translucent, with a slightly bluish tinge; in alcohol, yellowish; upper scales with dusky edges; top of head dusky; upper part of eye dark; fins, except ventrals and anal, with a little dusky color; a silvery color band extending from upper part of pectoral base to caudal, narrower on caudal, widening at base of caudal.

C. crystallinum closely resembles *C. ocotlane* in general appearance. The much shorter lower jaw and the smaller eye of *C. crystallinum* are at once distinguishing characters. Guadalajara and Laguna de Chapala, Mexico. (Jordan & Snyder.)

Two specimens from the Guadalajara market are shrunken so that the orbit is larger, and the teeth more evident than in those taken at Ocotlan.

Known from Laguna de Chapala, near Ocotlan, Jalisco, Mexico, and the market at Guadalajara. (Type, No. 6158, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Chirostoma crystallinum, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), ¶39, **Laguna de Chapala, Mexico.**

1157 (f). CHIROSTOMA LERMÆ, Jordan & Snyder.

Head $3\frac{1}{6}$; depth $5\frac{1}{8}$; depth of caudal peduncle $3\frac{2}{3}$ in head; eye $5\frac{1}{2}$; snout $2\frac{2}{3}$; interorbital space $5\frac{1}{2}$; height of spinous dorsal $4\frac{1}{2}$; soft dorsal $2\frac{1}{2}$; anal $2\frac{1}{6}$; length of pectoral $1\frac{2}{3}$; ventrals 3; caudal $1\frac{2}{3}$; D. IV–11; A. 20; scales 58–20, 11 between dorsals. Body slender, deepest part in region of ventrals; caudal peduncle narrow; snout long and pointed; lower jaw slightly projecting, but not enough to include the upper; eye large, nearer tip of snout than to posterior edge of opercle, a distance equal to diameter of orbit, or to width of preorbital space; cleft of mouth extending to a horizontal through lower edge of orbit; lower lip folded over the upper at their union; maxillary extending posteriorly almost to a perpendicular from anterior edge of orbit, its distal end angular; teeth large and strong, curved backward and inward, arranged in 2 definite rows, those of the inner row of the upper jaw and of the outer row of the lower jaw larger, none on vomer or palatines; vertebræ 44. An indefinite lateral line extending along body about 10 scales below first dorsal, the pores absent on many of the scales; scales crenate, largest along the lateral color-band, much smaller between occiput and first dorsal, those immediately posterior to occiput, minute and very closely crowded; a narrow edging of similar scales along the gill-openings, extending ventrally to the isthmus; scales between dorsals not much reduced in size or crowded together; basal half of inter-radial membranes of caudal with scales; first 2 spines of dorsal longest, third shorter, fourth about $\frac{2}{3}$ as long as the first; first dorsal ray longest, others gradually shorter, edge of fin straight; insertion of anal on a perpendicular passing through a point half way between origins of dorsals, first ray longest, others successively shorter, last ray one-third the length of first; caudal deeply forked, its tips rather pointed; pectoral pointed, extending beyond origin of ventrals a distance equal to diameter of pupil; ventrals reaching vent. Color in alcohol, light olive, a silvery lateral band equal to a scale in width extending from upper part of base of pectoral to base of caudal; edges of upper scales dusky; a little dark color on dorsals, caudal, and pectoral; upper and lower jaws and top of head with minute dark dots; upper part of eye dark.

C. lermæ closely resembles *C. crystallinum*. It differs markedly in having large teeth, which are arranged in two rows, a shorter lower jaw and a larger eye. Jalisco, Mexico. (Jordan & Snyder.)

Our specimens of *C. lermæ* are all from the market of Guadalajara. The gill-arches and viscera had been removed and the bodies were somewhat shrunken. The specimens are said to have come from Laguna de Chapala, Jalisco, Mexico. (Type, No. 6159, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Chirostoma lermæ, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 140, Guadalajara, Mexico.

1157 (g). CHIROSTOMA OCOTLANE, Jordan & Snyder.

Head $3\frac{1}{3}$; depth $4\frac{1}{2}$; depth of caudal peduncle $3\frac{1}{4}$ in head; eye $4\frac{1}{8}$; snout $2\frac{2}{3}$; interorbital space 5; height of spinous dorsal $3\frac{1}{2}$; soft dorsal $2\frac{1}{6}$; anal 2; length of pectoral $1\frac{2}{3}$; ventral $2\frac{1}{2}$; caudal $1\frac{1}{2}$; D. V–12; A. 20; scales 54–19, 11 between dorsals. Body long, rather slender, deepest above

ventrals; head long, pointed, its dorsal contour straight from tip of snout to a point a little posterior to the eye, where it curves upward; interorbital space flat; eye high up, nearer tip of snout than edge of opercle by a distance about equal to diameter of pupil; width of preorbital space equal to diameter of pupil; mouth oblique, the cleft extending downward to a point opposite lower edge of pupil; lips growing more fleshy posteriorly, the lower forming a fold across the upper at their junction; distal end of maxillary angular, extending almost to a vertical from anterior edge of orbit; lower jaw very long, projecting beyond upper a distance equal to diameter of pupil; viewed from above, both jaws are a little more pointed than are those of *C. estor* or of *C. humboldtianum*. Teeth on jaws in bands, minute, projecting backward; no teeth on vomer or palatines; gill-rakers slender, close together, length of longest equal to diameter of pupil; vertebræ 44. A rather indefinite lateral line extending along body, 10 scales below the first dorsal, the pores absent on many of the scales; scales crenate, growing smaller dorsally, larger ventrally, those on posterior part of occiput, on nape, on region anterior to pectorals—above and below, and on base of caudal, very small and crowded together, those in the region of dorsals not reduced in size or crowded except at insertion of fins, where there are 4 very small ones; cheek with 5 rows; lower jaw and upper part of snout naked; basal half of interradial membranes of caudal with minute scales; first 3 spines of dorsal highest, extending when depressed within half their length of origin of soft dorsal; first dorsal ray preceded by a shorter, simple, closely attached one; other rays successively shorter than first; edge of fin slightly concave; anal similar to soft dorsal in shape, its basis $1\frac{3}{5}$ times as long as that of soft dorsal; attachment of first ray under a point half way between insertions of dorsals; caudal deeply forked, the lobes equal; pectoral pointed when depressed, upper rays longest, extending to a vertical half way between insertions of first dorsal and ventrals. Body, during life, almost translucent, with a bluish tinge of color; in alcohol, the color is a light olive yellow; a silvery lateral band extending from axil to base of caudal, the band wider and brighter in color between dorsal and anal, growing narrow on caudal peduncle and then widening again at its posterior end. Head and body above, and the lower jaw, dusky; upper part of eye dark; edge of scales above lateral band with small black dots; caudal somewhat dusky on its basal third; other fins with little or no dark color.

Chirostoma ocotlane is easily distinguished from all other known species of the genus by its excessively long lower jaw. Except the jaw and somewhat larger eye it resembles *C. estor* in general appearance. Laguna de Chapala, Mexico. (Jordan & Snyder.)

Known only from Laguna de Chapala, near Ocotlan, Mexico. (Type, No. 6160, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Chirostoma ocotlane, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 141, Laguna de Chapala, near Ocotlan, Mexico.

1154. CHIROSTOMA ESTOR, Jordan.

We have examined the type specimen of *Chirostoma estor*. The scales are small and closely crowded on the region anterior to the pectoral from the occiput to the isthmus; they are not much reduced in size nor closely crowded together between the dorsals. The teeth on the jaws are large and numerous, not arranged in definite rows; there are 3 vomerine teeth almost as large as those on the jaws.

Some exact measurements of the type, expressed in hundredths of the length of the body, are here given:

Length of body in millimeters 212; depth of caudal peduncle 7½; length of head 31½; distance from snout to occiput 23; tip of lower jaw to occiput 24; width of interorbital space 7; length of snout 12; diameter of orbit 5⅜; distance from snout to spinous dorsal 56½; insertion of spinous to soft dorsal 12½; height of longest dorsal spines 7; of longest dorsal rays 11; distance from snout to anal 62½; height of longest anal rays 12; distance from anal to caudal 22; length of caudal fin 18½; of pectoral fin 17; distance from snout to ventral 45½; length of ventral fin 10½; D. V–12; A. 18; P. 14; scales 72–19, 9 between dorsals.

1154 (a). CHIROSTOMA ALBUM (Steindachner).

The type of *Chirostoma estor* agrees externally almost perfectly with Steindachner's account of *Chirostoma album* from Lake Pátzcuaro, a species which he later places in the synonymy of *C. estor*. But the type localities are widely separated, and Steindachner found no trace of the large vomerine teeth so conspicuous in *C. estor*. We therefore regard *C. album* as probably a valid species, not identical with *C. estor*.

Page 821. After *Joturus pichardi*, Poey, add:

368 (a). **NEOMUGIL,** Vaillant.

Neomugil, Vaillant, Bull. Soc. Philom., iv, 1893–1894 (June, 1894), 72 (*digueti*).

General aspect of *Mugil*. Mouth widely cleft, maxillary extending beyond anterior edge of orbit. Fine teeth in many series in each jaw, those of outer series on intermaxillary most developed, all conical, simple, small, but distinct; villiform teeth on vomer and palatines. Stomach siphonal, walls membranous, very thin in pyloric region, hence not gizzard-like; a large pyloric cœca and a second smaller one; pseudobranchiæ distinct.

This genus resembles *Joturus*, which has the teeth flattened and serrated, with only 1 series on the intermaxillary. The maxillary in *Joturus* extends not so far back. (Vaillant.) (*νέος*, new; *Mugil*.)

1198 (a). NEOMUGIL DIGUETI, Vaillant.

Head 3; depth 4; eye 6; interorbital 2.75. B. 6; D. IV–I, 8; A. I, 9; V. I, 5; scales 3–43–11; caudal fin 4. Maxillary reaching pupil; mouth deeply cleft; upper jaw the longer; no adipose eyelid. Origin of first dorsal at middle of body, the first spine 2 in depth of body; origin of anal

a little in front of second dorsal. Whole head, except preocular region, scaled like the body, the scales ctenoid.

Known from 20 examples from 99 to 194 mm. long, from Lower California, south of La Paz.

(Named for the collector of the type, M. Léon Diguet.)

Neomugil digueti, VAILLANT. Bull. Soc. Philom., IV, 1883–1894 (June, 1894), 73, torrent in the Sierra de las Cacachilas de Santa Cruz, Lower California.

Page 903. In the description of *Seriola lalandi* for "A. I, 27" read "A. I, 21."

Page 962. *Centrolophidæ* can not be maintained as a distinct family. It belongs with the *Stromateidæ*.

Page 1038. After *Hadropterus scierus serrula*, insert:

HADROPTERUS MAXINKUCKIENSIS, Evermann

Head 3.75; depth 6; eye 4; snout 4.2; maxillary 3.25; mandible 2.75; interorbital 6; pectoral 1.25; ventral 1.3; D. XIV, 13; A. II, 8; scales 7–61–10.

Body rather long, slender, and subterete; caudal peduncle somewhat compressed, its least width one-half its least depth; head rather long, snout pointed; mouth moderately large, oblique, maxillary reaching past anterior part of eye, lower jaw included; eye rather large, slightly above axis of body; interorbital moderately wide, nearly flat; gill-membranes free from each other and from the isthmus; opercle with a rather long flap and stout spines; premaxillaries not protractile; fins rather large; distance from origin of spinous dorsal to tip of snout slightly greater than base of spinous dorsal or nearly twice base of soft dorsal; longest dorsal spine 2.25 in head; soft dorsal higher than spinous portion, 2 in head, the free edge gently curved; origin of anal under that of soft dorsal, its base 2.1 in head; caudal rounded or slightly emarginate.

Scales firm and strongly ctenoid, lateral line complete and straight, beginning over opercular spine; top of head and an oblong area on nape naked; space in front of spinous dorsal with small embedded scales; opercle with about 7 rows of scales; cheek with a few small embedded scales, breast naked, except 2 or 3 partially embedded scales on median line; one large scale between ventrals; belly naked anteriorly, but with about 10 enlarged, stellate scales posteriorly; space between ventrals broad, equal to width of base of ventral; preopercle smooth.

Color essentially the same as in *H. scierus;* mottled and vermiculated with light and dark brown or blackish, the middle line of back with about 9 large, roundish, dark, confluent areas, each surrounded by a wavy, whitish line; middle of side with about 7 large, confluent dark spots, the anterior 2 largest and longest, the third small, the fourth large, and the remaining 3 progressively smaller; under parts yellowish white; top of head dark; a narrow whitish line around upper posterior part of orbit; a broad black line downward from eye; upper part of preopercle and nearly whole opercle dark, each dusted on lower part; cheek dusted with fine, dark specks; an irregular pale area at anterior end of lateral

line; spinous dorsal ashy, the first 3 spines black on the middle portion, the other spines dark, but not so distinctly so; tips of last few spines dark; soft dorsal light brownish or grayish, crossed near the base by a series of dark spots and above by 2 series of whitish spots; caudal spotted with white and brown; anal white, dusted with brownish; ventrals whitish, with fine, dark dustings; pectoral whitish, yellowish at base, followed by alternating series of dusky and whitish spots.

This species is related to *H. scierus*, from which it differs chiefly in having the dorsal fins united, in having the maxillary reaching beyond front of orbit, in the larger scales, the free gill-membranes, and in the smooth preopercle.

Only the type known, an example, 3.5 inches long, taken in Aubeenaubee Creek, the eastern inlet of Lake Maxinkuckee, Indiana, about ½ mile from the lake, August 4, 1899. Type No. 49378, U. S. N. M. Coll. Evermann & Scovell.

Hadropterus maxinkuckiensis, EVERMANN, Rept. U. S. Fish Com. 1899 (1900), 366, with plate, Aubeenaubee Creek, Lake Maxinkuckee, Indiana.

Page 1084. Before *Etheostoma jessiæ*, insert:

ETHEOSTOMA AUBEENAUBEI, Evermann.

Head 3.6; depth 5.5; eye 4.5; snout 4.5; maxillary 3; interorbital 5; D. X-10; A. II, 7; scales 4–55 to 58–7, 8 to 24 pores.

Body rather elongate, not much compressed except posteriorly; head rather short; snout short, somewhat decurved; mouth moderate, slightly oblique, lower jaw included, maxillary reaching front of eye; eye small, above axis of body; premaxillaries not protractile; gill-membranes free from the isthmus and each other. Fins not large, the dorsals usually distinctly, but narrowly separated, sometimes scarcely separate; origin of spinous dorsal one-third distance from tip of snout to base of caudal; outline of spinous dorsal gently rounded, the longest spine about 3 in head; longest dorsal ray about 2; first anal spine longer, and slightly stronger than second, 3 to 3.5 in head; longest anal ray about 2; pectoral short, about 1.3 in head; ventrals close together, about 2 in head; caudal rounded, 1.5 in head. Scales rather small, rough-ctenoid; lateral line incomplete, usually developed on only 8 to 24 scales at anterior end; cheek usually naked or with a few small, more or less embedded scales; opercle usually about half scaled, sometimes with but few scales; breast always naked; belly with ordinary scales; nape usually densely and regularly scaled, some scales sometimes embedded; preopercle entire; opercular flap moderate, broad; opercular spine rather small; no humeral spot or process.

Color in alcohol, greenish brown above; side with about 12 or 13 vertical, dark blotches, separated by pale orange red areas of similar size; another series of similar but smaller orange blotches along lower part of side anterior to anal fin; under parts whitish; caudal peduncle grayish; head dark above; opercle and cheek dark, with greenish shade; a dark line downward from eye; snout grayish; spinous dorsal with a narrow dark border, below which is a broad orange band, then a broad but irregu-

lar dark band along base of fin; soft dorsal and caudal barred with white and grayish, the latter in spots on the rays; anal and ventrals without markings; pectoral somewhat dusky.

This species is close to *E. iowæ*, from which it seems to differ in the almost naked cheek, the less complete scaling of the opercles, the somewhat longer maxillary, more oblique mouth, closer approximation of the dorsal fins, and the coloration. Lake Maxinkuckee, Indiana.

Many examples, each about 2 inches long, taken in Aubeenaubee Creek, the east inlet of Lake Maxinkuckee, August 4, and on other days in August and September, 1899. *E. iowæ* is a common species in the lake, but does not occur in the inlet, nor were we able to find any specimens of *E. aubeenaubei* anywhere except in this small creek. Type No. 49379, U.S.N.M. Coll. Evermann & Scovell.

Etheostoma aubeenaubei, EVERMANN, Rept. U. S. Fish Com. 1899 (1900), 367, with plate, Aubeenaubee Creek, Lake Maxinkuckee, Indiana.

Page 1212. Before *Prionodes fasciatus*, Jenyns, insert:

1597 (a). PRIONODES BALDWINI, Evermann & Marsh.

Head 2.5; depth 3.2; eye 4; snout 4.6; maxillary 2.4; mandible 2; interorbital 7; D. x, 12; A. III, 7; pectoral 1.4; ventral 1.3; caudal 1.7; scales 4–42–12.

Body elongate, moderately compressed, not elevated, covered with ctenoid scales; dorsal and ventral outlines alike; head moderate, pointed, naked above and below; eye large, greater than length of snout, high in position; mouth terminal, slightly oblique, the maxillary reaching middle of eye or somewhat beyond; gill-rakers short, 6 developed on lower limb; teeth small, conical, and sharp, on vomer and palatines and in several series in each jaw, with weak canines in front and a few canine-like teeth on middle of side of lower jaw; cheek with about 7 rows of scales; preopercle finely serrate; opercle ending in 3 sharp, flat spines, the middle one largest, a membranous pointed flap projecting beyond; fins all naked, the dorsal continuous, with a slight emargination, the spines slender and pungent, the first 4 or 5 graduated, the rest subequal, 3.2 in head, lower than the soft rays which are contained about 2.5 in head; anal fin short, the second spine longest and strongest, 3 in head, the soft part high, the fifth or sixth ray longest, reaching almost to front of anal, 2 in head; ventral with second ray produced, reaching vent; caudal truncate, or with middle rays very slightly shorter, making the margin slightly concave.

Color in life: Dorsal half of head and trunk and all of caudal peduncle scarlet, ventral portion pale blue, almost white; a yellow longitudinal band nearly as wide as pupil from preopercular margin straight across opercle and along body to lateral line under last dorsal rays; 4 quadrate or oblong black blotches just under this band, the first about under middle of spinous dorsal, second under last spines, third under first rays, fourth under last rays; from each of the first three of these blotches a square, well-defined yellow shade extends downward to belly or base of anal, a similar one from base of pectoral to ventral; 4 smaller black blotches at base of caudal, two others, somewhat larger than the last, just in front of

them on caudal peduncle; a row of 9 round black spots on each side at base of dorsal fin, the first one smallest, opposite membrane of first spine, the other 8 separated somewhat obscurely into pairs, the first pair under middle spines, second under last spines, third under first rays, fourth under last rays; 2 or 3 very small black dots on upper edge of caudal peduncle; 2 or 3 more in front of dorsal on median line, each accompanied by a similar one on either side; in some specimens a few scattering ones on top of head behind eyes, sometimes regularly arranged; a few dark-brown spots behind eye; various dark markings on side of head, without very definite pattern, but usually 2 oblique stripes on cheek, a heavy black blotch on interopercle and 2 on the ramus of the mandible, which, with their fellows of the other side, make distinct crossbars on lower side of head usually extending across maxillary; chin and lower part of opercle with dark spots; lateral line white, with a few broken spots, comparatively faint, just below it; iris red, with an inner ring of white surrounding the pupil; spinous dorsal pale, the edge of the membrane black, this color bordered below with faint yellow; soft dorsal pale, spotted throughout with light orange, with a marginal band of the same, outside of which is a very narrow pale-blue edge; ventral very pale blue, the produced ray somewhat yellow; anal pale blue with some light orange on last rays; pectoral and caudal uniform pale reddish, unmarked.

In spirits all the red and yellow markings disappear, the dark persists, and additional markings are brought out as follows: Along the anterior and upper part of trunk and crossing the lateral line are dark-brown vertical bars, diffuse and running together, or separated and broken into round or quadrate blotches; in the middle part of the course of the yellow longitudinal band appears a row of very small black points; spots on soft dorsal dusky; dark mottlings on caudal; upper and lower base of pectoral, and sometimes axil, dusky.

Puerto Rico. A beautiful and strongly marked species; 2 specimens dredged and 33 others, ranging in size from 0.55 to 2 inches, caught in the tangle, off Culebra and Vieques islands, from coral bottom, in depths of 15 and 16 fathoms; the type, 2 inches long, taken in the tangle at *Fish Hawk* Station 6093, off Culebra Island, 5.25 miles southwest of Culebritas light-house, February 8, 1899, in 15 fathoms, by the U. S. Fish Commission expedition to Puerto Rico. ("Named for Mr. Albertus H. Baldwin, the artist of the U. S. Fish Commission expedition to Puerto Rico, in recognition of his excellent drawings and paintings of American fishes.")

Prionodes baldwini, Evermann & Marsh, Report U. S. Fish Com. 1899 (December 19, 1899), 353, off Culebra Island, P. R. (Type, No. 49361, U.S.N.M. Coll. Evermann & Marsh.)

Page 1229. After *Gramma loreto*, Poey, insert:

518 (a). **RHEGMA**, Gilbert, new genus.

Rhegma, Gilbert, new genus of Serranidæ (*thaumasium*).

Allied, but not closely, to *Rypticus*, *Grammistes* and *Gramma*, having the large, ctenoid scales and interrupted lateral line of *Gramma* and the peculiar physiognomy, attachment of gill-membranes, and fin structure of the *Rypticinæ*.

Scales of moderate size, thin, not embedded, minutely ciliated; lateral lines 2, the upper near base of dorsal, ceasing under origin of posterior fifth of soft dorsal, the lower line beginning slightly in front of the end of the upper line, running along middle of caudal peduncle; the tubes very short, borne on much smaller intercalated scales, and not forming a continuous line; head largely scaled, the snout and jaws naked; gill-membranes united anteriorly, forming a narrow free fold across the isthmus; branchiostegals 7; pseudobranchiæ well developed; a wide slit behind last gill-arch; gill-rakers short, broadly triangular, strongly toothed. Upper margin of opercle, above its angle, wholly attached by membrance to the shoulder girdle, as in the *Rypticinæ*. Mouth large, protractile, the lower jaw protruding, the maxillary broadly exposed, with a narrow supplemental bone along its upper edge. Teeth all villiform, in broad bands on jaws, vomer and palatines, the inner teeth on jaws slightly longer than the others and depressible. Tongue smooth. Large mucous pores on under side of mandible, and slit-like pores present on edge of preorbital and around front of eye. Anterior nostril near edge of preorbital, provided with a short tube; posterior nostril without tube or raised rim, immediately in front of eye; a short free triangular flap on upper edge of each orbit. Upper portion of preopercle with a single strong plectroid spine, directed backward and downward; bones of the head otherwise unarmed, the preorbital and preopercle with entire edges, the opercle without spines or ridges. Ventrals small and anterior in position, as in the *Rypticina*, consisting each of one strong spine, and five branched rays, their base being in front of base of pectorals; no enlarged scale behind base of ventrals; vertical fins low, with rounded lobes, their basal portions well scaled; dorsal with 7 low strong spines and 22 profusely branched rays; anal with 3 spines and 18 rays. One species, apparently the type of a distinct subfamily, *Rhegmatinæ*.

(*ῥῆγμα*, fracture; referring to the interrupted lateral line.)

1615 (a.) RHEGMA THAUMASIUM, Gilbert, new species.

Head 2⅔ in length; depth 3; eye 5 in head; D. VII, 22; A. III, 18. Scales 45 in a longitudinal series along middle of side. Body elongate, moderately compressed, with very short, deep, caudal peduncle; anterior profile strongly arched, slightly depressed above orbits; interorbital space very narrow, convex, its width two-thirds diameter of orbit. Mouth large, slightly oblique; lower jaw the longer, its tip entering the profile. Dorsal spines low, strong, increasing backward, the last spine a trifle longer than diameter of orbit; anal spines short and strong, the middle spine longest. Lateral line curved strongly upward from its origin to below third dorsal spine, thence running parallel with the back to below middle of second dorsal, from which point it gradually approaches the base of the dorsal, where it terminates under the fifth ray from the last; along its anterior course it is separated from base of dorsal by from 4 to 6 scales (in oblique series); scales minutely ctenoid except on head, breast, and belly, on nape under anterior dorsal spines, and on base of pectoral; top of head scaled forward to interorbital space, the anterior scales here,

as well as those on cheek, much reduced in size, embedded, so that their outlines can not be distinguished.

The following measurements of the type specimen are given:

	m.m.	One-hundredths of length to base of caudal.
Total length	85	
Length to base of caudal	70	
Greatest depth		33
Least depth caudal peduncle		15½
Length of caudal peduncle		8
Distance from tip of upper jaw to end of opercular flap		37
Length of snout		6
Diameter of eye		7½
Interorbital width		3¾
Tip of snout to end of maxillary		19
Length of pectoral		27
Tip of snout to base of upper pectoral ray		35
Tip of snout to base of ventrals		31
Length of ventrals		13
First anal spine		3½
Second anal spine		6
Third anal spine		4½
First soft anal ray		8½
Longest soft anal ray		15
First dorsal spine		4
Last dorsal spine		9
Longest dorsal ray		15
Caudal		23

Color, nearly uniform warm brown on head, body, and fins; a dusky opercular blotch; soft dorsal, anal and caudal only narrowly margined with white.

One specimen known, from Panama.

(θαυμάσιος, wonderful.)

Rhegma thaumasium, Gilbert MS., Panama (Coll. C. H. Gilbert. Type, No. 5978, L. S. Jr. Univ. Mus.)

Page 1300. After *Hæmulon scudderi*, Gill, insert the following:

1667 (a). HÆMULON HELENÆ, Boulenger.

Head 3½; depth 2⅔; eye 3½ in head; interorbital width 3½. D. XIII, 16; A. III, 12; scales 11–87–20, 67 pores.

Profile very much arched from snout to origin of dorsal; muzzle not reaching beyond lower jaw, little shorter than eye; mouth little oblique; maxillary reaching anterior ¼ of eye; teeth very small; 2 very small pores in chin; preopercle very feebly serrate; head scaled, except snout and chin; gill rakers very short, 15 on lower arm of arch; dorsal spines feeble, increasing to the fourth, which almost equals ½ length of head, then decreasing to the last, which is contained 1½ times in head; soft dorsal low, covered with scales; pectoral falciform, longer than head, 1⅔ times ventral;

anal spines small, increasing to the third, which is 5 in head; soft anal low and scaly; caudal almost completely scaled, deeply emarginate, the median rays less than half the external ones; caudal peduncle ½ times longer than deep; scales above lateral line in very oblique series. Grayish above, with oblique brown lines, somewhat undulating; silvery below. Length 22 cm. One specimen from Bay of Santa Elena, Ecuador. (Boulenger.) (Named for the type locality.)

Hæmulon helenæ, BOULENGER, Bollettino dei Mus. di Zool. ed Anat. Comp. della Univ. di Torino, Vol. XIV, No. 335, 3, Feb. 15, 1899, **Bay of St. Elena, Ecuador.** (Coll. Dr. Enrico Festa.)

Page 1334. After *Pomadasis ramosus* (Poey), insert the following:

1706 (a). POMADASIS LABRACIFORME (Boulenger).

Head 3; depth 3½; eye 4; snout slightly longer than mandible, by ¼ diameter of eye, which is little more than interorbital width; maxillary reaching anterior ⅓ of eye; D. XIII, 12; A. III, 7; scales 8 or 9–68–22; teeth very small; 2 pores in chin; preopercle strongly serrate, strongest at angle; head scaled, except snout and lips; gill-rakers 13 on lower arm of first arch, the longest equaling ⅓ length of gill-filaments. Dorsal spine strong, the fifth longest, 2 in head, from which they decrease to next to last, which is 4½ in head, and a little shorter than last; soft dorsal scaled at base, its longest rays a little shorter than longest spine; pectoral 1½ in head, scarcely shorter than ventrals; second anal spine very strong, 3½ in head, third 2 in head; longest anal rays shorter than anal spine; caudal peduncle longer than deep; scales arranged in series scarcely oblique above the lateral line, which has 54 pores. Color uniform silvery. Length 17 cm. One specimen known, from the Bay of St. Elena, Ecuador. (Boulenger.) (*Labrus; forma,* form.)

Pristipoma labraciforme, BOULENGER, Bollettino dei Mus. di Zool. ed Anat. Comp. della Univ. di Torino, Vol. XIV, No. 335, 3, Feb. 15, 1899, **Bay of Santa Elena, Ecuador.** (Coll. Dr. Enrico Festa.)

Page 1351. After *Calamus proridens*, Jordan & Gilbert, insert:

1721 (a). CALAMUS KENDALLI, Evermann & Marsh.

(PLUMA.)

Head 3.1; depth 2.1; eye 3.5; snout 1.5; maxillary 2.4; interorbital 3.5; preorbital 2.1; D. XII, 12; A. III, 10; pectoral 1; ventral 1.8; caudal 1.3; scales 7–53–16.

Body deep, back strongly elevated, more so than in *C. bajonado*, but less than in *C. calamus* or *C. proridens*, the anterior profile a nearly regular curve, lacking the abrupt nuchal elevation of those species; eye large, larger than in *C. proridens;* 7 or 8 rows of scales on cheek; teeth about as in *C. proridens;* molars in 2 or more rows on sides, those of inner row much the largest, those in front becoming more numerous and merging into cardiform teeth, the most anterior of which, in each jaw, are somewhat enlarged; in front of upper jaw are 2 much enlarged antrorse canines, curved slighly upward; highest dorsal spine 2.7 in head, second anal spine 4.6.

Color in spirits: Silvery, side with bluish longitudinal lines following the rows of scales, plainest above; a pale-blue line bordering the orbit below; some blue lines on preorbital, not evidently reticulated and not as numerous as in *C. proridens;* iris yellow; otherwise as in *C. proridens,* to which this species is very close.

Puerto Rico; known from the type, a specimen 10.5 inches long, from Mayagüez, January 20, 1899, and 2 cotypes, each 8.5 inches long, one from Mayagüez, the other from Arroyo, all collected by the U. S. Fish Commission expedition to Puerto Rico. (Named for Dr. William Converse Kendall, assistant, U. S. Fish Commission.)

Calamus kendalli, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 354, Mayagüez, Puerto Rico. (Type, No 49362, U.S.N.M. Coll. Evermann & Marsh.)

Page 1417. For *Nebris zestus,* Jordan & Starks, substitute *Nebris occidentalis,* Vaillant.

The synonymy of this species is as follows:

Nebris occidentalis, VAILLANT, Notes from the Leyden Museum, XX, 20, October, 1897, Panama; after description by Jordan & Eigenmann.

Nebris zestus, JORDAN & STARKS, in Jordan & Evermann, Fishes North & Middle America, Part II, 1417, October 3, 1898, Panama. (Type, No. 433, L. S. Jr. Univ. Mus. Coll. Dr. C. H. Gilbert.)

Page 1439. After *Bairdiella chrysoleuca* (Günther), insert the following:

1820 (a). BAIRDIELLA MIACANTHA (Boulenger).

Head $3\frac{1}{3}$ to $3\frac{1}{2}$; depth $3\frac{1}{3}$ to $3\frac{1}{2}$; eye $4\frac{1}{3}$ to $4\frac{1}{2}$, 1 to $1\frac{1}{5}$ in interorbital width. D. XI, 21 or 22; A. II, 7 or 8; scales 5 or 6-45 to 49-11 or 12, 50 to 55 pores. Snout round, scarcely longer than eye; mouth inferior, compressed, scarcely oblique, with simple subequal teeth, the gape reaching anterior $\frac{1}{4}$ or $\frac{1}{5}$ of eye; 2 very strong spines at angle of preopercle, the lower directed downward; gill-rakers very short, 10 or 11 on lower arm of first arch; third dorsal spine longest, $\frac{2}{3}$ to $\frac{3}{4}$ length of head; pectoral $1\frac{1}{4}$ in head; first anal spine very small, the second small, $2\frac{1}{2}$ to 3 in head, or $1\frac{1}{2}$ in longest soft ray; caudal acuminate; caudal peduncle a little longer than deep. Grayish above, with faint brown stripes following series of scales; silvery below. Close to *B. chrysoleuca,* Günther, from which it is sufficiently distinguished by the less development of the second anal spine, the smaller mouth, and the feebler dentition. Length 21 cm. Three specimens known from the port of Guayaquil. (Boulenger.)

Corvina miacanthus, BOULENGER, Bollettino dei Mus. di Zool. ed Anat. Comp. della Univ. di Torino, Vol. XIV, No. 335, 5, Feb. 15, 1899, port of Guayaquil. (Coll. Dr. Enrico Festa.)

Page 1526. After *Cichlasoma centrarchus* (Gill & Bransford), insert:

1923 (a). CICHLASOMA STEINDACHNERI, Jordan & Snyder.

Head $2\frac{1}{2}$; depth 3; depth of caudal peduncle $7\frac{1}{2}$; eye $3\frac{2}{3}$ in head; snout $2\frac{4}{5}$; interorbital space 5; longest dorsal spine 4, ray 2; longest anal spine $2\frac{3}{8}$, ray 2; length of pectorals $1\frac{1}{2}$; ventrals $1\frac{4}{5}$; caudal $1\frac{1}{2}$; D. XVI, 10; A. V, 8; P. 14; scales 26-14, 7 on caudal peduncle. Length of head exceeding its depth a distance equal to diameter of orbit; body elongate, deepest above

ventrals; curve of dorsal outline interrupted by a slight elevation above eye and a rather rapid descent at base of soft dorsal; ventral outline less curved than dorsal; interorbital space convex; orbit somewhat elongate laterally, located slightly nearer tip of snout than to posterior edge of opercle, its lower edge a little above a horizontal from mouth to middle of caudal peduncle; cleft of mouth almost horizontal; maxillary, except distal end, concealed by preorbital; lips thick, the lower with a narrow frenum; jaws equal, the upper moderately protractile; teeth in 2 series on each jaw, outer series in a single row, large, canine-like, far apart; inner series minute, in bands; tips of teeth brown-colored; no teeth on vomer or palatines. Gill-membranes forming a fold across the isthmus; gill-rakers on first arch 10, short and blunt. Body covered with large weakly-ctenoid scales; head with cycloid scales; upper part of head anterior to middle of orbit, snout, preorbital area, and ventral part of head, naked; a single row of small scales along bases of dorsal and anal fins; small scales on basal part of inter-radial membranes of caudal; lateral line interrupted at the fourteenth scale, beginning again 3 scales lower and extending to base of caudal; first dorsal spine very short, others gradually longer to the sixth or seventh, after which the spines are about the same length; fifth and sixth dorsal rays longest, about 1½ times the length of longest spine, depressed fin extending to posterior edge of dark caudal spot; first anal spine shortest, one-fifth as long as fifth spine. third, fourth, and fifth rays longest; depressed fin extending to anterior edge of caudal spot; caudal fin evenly rounded; pectoral rounded, extending to a vertical from vent; outer rays of pectoral longest, extending to vent. Color in alcohol, light olive, darker above than below; an indistinct, dark lateral band extending from snout to caudal; 8 or 9 scarcely distinguishable dark vertical bands on side of body; irregular dark spots at intersection of lateral and vertical bands; a small, dark spot at base of caudal; small, distinct dark dots on anterior dorsal region of head.

The total length of the type is 61 mm. Younger examples measuring about 43 mm. have the body a little deeper and the head shorter. The vertical color bands on posterior half of body are more distinct on the younger individuals. Rio Verde, Mexico. (Jordan & Snyder.)

Cichlasoma steindachneri, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 143, Rio Verde near Rascon, Mexico. (Type, No. 6164, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Page 1540. Before *Theraps*, Günther, insert the following:

1948 (a). HEROS ISTLANUS, Jordan & Snyder.

Head 2⅔; depth 2⅔; depth of caudal peduncle 7; eye 4½ in head; snout 2¼; interorbital space 3½; longest dorsal spine 2⅔, ray (without filament) 1⅔; longest anal spine 2⅔, ray (without filament) 1⅓; length of pectoral 1½; ventrals 1⅓; caudal 1½; D. XVI, 10; A. V,. 7; P. 14; scales 28–18. Body elongate, compressed, deepest above insertion of ventrals; dorsal outline rising rapidly to origin of dorsal, falling gradually to base of last spine, from which the descent to the caudal peduncle is more abrupt; ventral outline evenly rounded; interorbital space convex; eye large, orbit circular, equally distant from tip of snout and posterior edge of

opercle; mouth horizontal, lower jaw projecting; lips thick, the lower without frenum, folding over the upper at their union; premaxillary protractile; maxillary small, nearly vertical in position, and almost hidden by the large preorbital; teeth on both jaws, in 2 series, the outer a single row of 24 canines, largest in front, growing smaller posteriorly, the inner series villiform; all of the teeth with brown-colored tips; gill-membranes free from isthmus; branchiostegals 5; gill-rakers on first arch 9, short, blunt, far apart. Body covered with large scales; cheek, opercle, interopercle, subopercle, and occipital portion of head with small scales; ventral part of head, preorbital area, snout, and anterior part of interorbital space naked; one row of scales extending on bases of dorsal and anal fins; scales of body weakly-ctenoid; scales of head smooth; lateral line interrupted on the nineteenth transverse row of scales, beginning again 3 scales lower down and 2 scales in advance of where it left off and extending to base of caudal; first dorsal spine short and slender, others gradually longer and heavier, posterior spine longest; each spine with a rather stiff distal, ray-like attachment, the anterior edge of which projects above the membrane of fin; tips of fourth and fifth rays of dorsal uniting to form a thread-like filament about as long as the diameter of orbit; dorsal, when depressed, extending on caudal one-third its length; first anal spine shortest, others growing gradually longer and heavier, the last $2\frac{1}{2}$ times as long as the first; spines with distal attachments similar to those of dorsal, third and fourth rays longest, united at their tips, forming a slender filament; tip of anal extending a little farther posteriorly than that of dorsal; caudal rounded; tip of pectoral rounded; ventrals located slightly posterior to base of pectoral, extending to vent, outer ray longest, ending in a filament. Color dark, an oblong brownish-black spot at base of each scale on side of body, the spots growing less distinct above the pectoral; membranes of dorsal, anal, and caudal with small spots, these more distinct and regularly arranged on soft parts of dorsal and anal; pectoral and ventrals without spots.

Young individuals have a brownish-black spot at base of caudal and on side of body at tip of pectoral; a less distinct spot at upper edge of gill-opening and also below posterior end of base of dorsal. The darker of these spots are sometimes faintly indicated on the larger individuals. Morelos, Mexico. (Jordan & Snyder.)

Known only from Rio Ixtla at Puente de Ixtla, Morelos, Mexico. (Type, No. 6150, L. S. Jr. Univ. Mus. Coll. Jordan & Snyder.)

Heros istlanus, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 144, Rio Ixtla, Morelos, Mexico.

Page 1542. After *Neetroplus nicaraguensis*, Gill & Bransford, insert:

1951 (a). NEETROPLUS CARPINTIS, Jordan & Snyder.

Head $2\frac{5}{6}$; depth 2; depth of caudal peduncle 6; eye 5 in head; snout $2\frac{1}{5}$; interorbital space $2\frac{2}{3}$; longest dorsal spine $2\frac{1}{3}$; ray $1\frac{1}{4}$; longest anal spine 2, ray $1\frac{1}{3}$; length of pectoral 1^2; ventrals $1\frac{1}{3}$; caudal $1\frac{1}{5}$; D. XVI, 10; A. V, 8; P. 15; scales 26–17, 7 on caudal peduncle. Body compressed, deepest part above ventrals; dorsal outline straight from tip of snout to a

point above anterior edge of orbit, where it is abruptly curved upward and backward to the origin of dorsal fin; from the latter point it gradually curves downward to base of first dorsal ray, from which the descent to caudal peduncle is abrupt; ventral outline evenly curved from snout to caudal peduncle; interorbital space convex, its middle portion flattened; orbit circular, nearer to posterior edge of opercle than to tip of snout, a distance equal to diameter of pupil; mouth oblique, lower jaw slightly projecting; lips thick; lower jaw with a frenum equal in width to ½ diameter of pupil; upper jaw protractile; maxillary covered by preorbital except at its distal end; teeth in 2 series on each jaw, the outer series in a single row, flat or incisor-like, larger in front, growing much smaller posteriorly, the inner series minute, in narrow bands, all the teeth loosely attached, their tips brown-colored; no teeth on vomer or palatines; gill-membranes forming a fold across the isthmus; gill-rakers on first arch 10, short, far apart. Body covered with large, weakly-ctenoid scales; cheek, opercle, and occipital portion of head with small, cycloid scales; lower jaw, snout, and anterior half of interorbital space naked; bases of dorsal and anal fins with a row of small scales; inter-radial membranes of caudal with very small scales on basal parts; lateral line interrupted on the nineteenth transverse row of scales, beginning again 3 scales lower down on the third row anterior to where it left off, and extending to base of caudal; 2 short rows of mucous tubes on inter-radial caudal scales, one above and the other below end of lateral line; first dorsal spine shortest, others gradually longer and heavier, each spine with a ray-like attachment projecting above and posterior to its tip; first anal spine shortest, others gradually longer and heavier, the fourth three times as long as the first; spines with distal attachments similar to those of the dorsal, third and fourth rays longest, extending posteriorly as far as those of the dorsal; posterior edge of caudal somewhat convex; pectoral rounded; ventrals pointed, the outer ray much the longest, extending a little beyond vent. Color in alcohol, light slate; scales with lighter central spots; posterior parts of dorsal, anal, and caudal lighter; in life the head was covered with round and elongate spots of greenish blue on a background of golden brown; side of body with bluish and brownish spots without regularity of arrangement; pectoral and distal part of soft dorsal with a yellowish tinge.

In the young of this species there are 5 or 6 dark vertical bands, about equal in width to diameter of orbit, on the posterior part of the body; a dark spot sometimes present just below lateral line on a vertical through base of eleventh dorsal spine.

This species differs from *N. nematopus* and *N. nicaraguensis* in having a much deeper body and fewer dorsal and anal spines. Laguna del Carpinte, Mexico. (Jordan & Snyder.)

One specimen (type, No. 6162, L. S. Jr. Univ. Mus.) from Laguna del Carpinte, near Tampico, Tamaulipas, Mexico, collected by J. O. Snyder.

Neetroplus carpintis, Jordan & Snyder, Bull. U. S. Fish Com. 1899 (1900), 145, Laguna del Carpinte, near Tampico, Mexico.

Page 1557. *Eupomacentrus flavilatus* (Gill), is the young of *Eupomacentrus rectifrenum* (Gill).

Page 1612. Before *Xyrula*, Jordan, insert:

2022 (a.) DORATONOTUS DECORIS, Evermann & Marsh.

Head 2.6; depth 3.4; eye 4; snout 3.5; maxillary 4; interorbital 4.6; D. IX, 10; A. III, 9; pectoral 1.6; ventral 2.2; caudal 1.6; scales 1–26–6. Body moderately elongate, compressed throughout; the back a little elevated, the caudal peduncle deep and rather long; dorsal and ventral outlines nearly alike, the dorsal somewhat more strongly arched; anterior profile not trenchant, almost straight from snout to front of dorsal, very slightly convex in front of dorsal and very slightly concave between eye and tip of snout; head pointed, interorbital space broad and flat; eye large, high in position, middle of pupil nearer tip of snout than end of opercle; snout long, somewhat longer than diameter of eye, moderately produced, the lips broad in front, characteristically labroid; mouth not large, the maxillary not reaching front of orbit, the jaws equal, armed with strong, sharp teeth, about 4 canines in front of upper jaw, 2 in front of lower; teeth on sides of jaws also canine-like, smaller than those in front, but not distinctly different from them; a few smaller teeth behind the main row of large ones; vomer and palatines toothless; soft dorsal and anal each with a basal sheath of about two rows of large scales, that of dorsal extending over half the fin or more, that of anal lower, the fins otherwise naked; dorsal fin continuous, with a shallow notch, the spines slender and pungent, the second longer than the first, the following ones graduated to the fifth, which is shortest, thence increasing in length to the ninth, which is longest, 2.3 in head; soft dorsal with its middle rays highest, 2.2 in head; anal with three slender, sharp, graduated spines, the third longest, 2.2 in head; the soft part similar to soft dorsal, longest rays 2.3 in head; pectoral large, symmetrical, of 11 rays, the middle ones longest, reaching past tip of ventral nearly to vent; ventral moderate, pointed, reaching half-way to vent; caudal rounded; scales large, cycloid the lateral line on second row below the dorsal interrupted near the end of dorsal and beginning again on the row below, on caudal peduncle.

Color in life: Body chiefly green, darker green on back, lighter below; lower parts of head and breast light yellow; a broad white bar from eye obliquely across cheek and opercle, bordered above by an undulating maroon line and below by a similar but fainter line; a brown bar from eye to snout; 4 dusky spots near base of dorsal extending as fainter shades downward and slightly forward to or beyond lateral line, 1 from in front of dorsal, 2 under spinous dorsal, and 1 under soft rays; short pale-blue bars or spots on breast and about pectoral; iris blue, a pinkish border surrounding pupil; dorsal greenish, the soft part with yellow shade, a pale-blue edging to the whole fin, a maroon border to the green color posteriorly just inside the pale-blue edge, a small dark spot on membrane between seventh and eighth rays and a blue spot on membrane of first spine; anal colored like soft dorsal, the maroon border extending from first spine to last ray inside the pale edging, the dark spot between sixth and seventh rays; ventral green near base, pale blue outwardly, the green color bordered by maroon spots; pectoral plain, pale green; caudal very pale transparent blue, a wedge-shaped maroon spot on the 2 upper rays

near tip and a corresponding one on the 2 lower rays, the base of the wedge on outer ray; base of caudal with a pale undulate vertical bar bordered in front by a black line.' In spirits, pale green, the maroon markings faintly persistent, becoming dusky.

Puerto Rico; known only from the type, 1.45 inches long, taken in the seine at Ponce, January 30, 1899, by the United States Fish Commission expedition to Puerto Rico. (*decoris*, beautiful.)

Doratonotus decoris, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 355, Mayagüez, P. R. (Type, No. 49363, U.S.N.M. Coll. Evermann & Marsh.)

Page 1720. A specimen of *Alutera monoceros* (Osbeck) has recently been recorded by Dr. H. M. Smith from Woods Hole, in Bull. U. S. Fish Com. 1898 (1899), 273, pl. 64.

Page 1733. *Tetrodon nephelus*, Goode & Bean, is a good species distinct from *T. spengleri*, Bloch, and should stand as

2147 (a). **SPHEROIDES NEPHELUS** (Goode & Bean).

Page 1968. To the synonymy of *Uranidea gracilis* (Heckel), add:

Cottus gracilis cayuga, MEEK, Ann. N. Y. Ac. Sci., IV, 1888, 315, Cayuga Lake, N. Y.

Page 2017. The recent studies of the tide-pool Cottoids of the California coast by Mr. Arthur W. Greeley have resulted in the discovery of some new species and genera and other additional information regarding this group of fishes. The following new species and genera are to be added:

2384 (a). **BLENNICOTTUS RECALVUS**, Greeley.

Head $3\frac{2}{3}$; eye $4\frac{2}{3}$ in head; snout 3; D. IX, 15 or 16; A. 11 or 12; P. 14. Body short, stout, broad anteriorly; the head very broad, short and blunt; snout obtuse; interorbital space 5/6 eye, grooved, the groove leading into a depressed space behind the eyes; mouth distinctly terminal, the maxillary reaching a vertical below the anterior edge of orbit, the lower jaw included; minute conical teeth on jaws, vomer, and palatines; nasal spines very small; no preopercular spine apparent in adults; edge of preopercle rounded; opercle ending in a rounded flap; branchiostegals six, the membranes broadly united, free from the isthmus; gills $3\frac{1}{2}$, a slit behind the last gill. Dorsal fins very long, slightly joined at the base, origin of first dorsal directly over tip of opercle, that of soft dorsal in advance of origin of anal; first dorsal slightly rounded, the middle ray the longest; pectoral reaching origin of anal, membranes of first seven rays deeply emarginate; ventrals reaching vent; anal papilla of male very large; anal low, the membranes of all the rays except the last three deeply emarginate, none of the rays enlarged in the male; caudal short, slightly rounded.

Cirri few and small, those of top of head joined at base in conspicuous bunches, two irregular occipital rows, a few below these on the side of head, and on the margins of preopercle and opercle; a few above origin of pectoral, and a weak row along the anterior third of the lateral line.

Color of body, light brown, vermiculated with white, and marked dorsally with 4 or 5 wedge-shaped spots of dark brown, edged with white,

and more distinct posteriorly; 2 pinkish spots on the dorsal side of the caudal peduncle, and a faint shading of the same color on side of head and along anterior fourth of lateral line; entire under surface dull brown, tinged with olive; fins indistinctly barred with grayish white; tail faintly tinged with pink. In some specimens the color is an almost uniform dull brown while in others the light markings are prominent. Some young individuals from among the green algae are uniform light green.

The bluntness of the snout and preopercular spines, and the terminal mouth make this species easily distinguishable from all related forms, except *B. globiceps*, from which it is separated by the shape and size of its preopercular and nasal spines, the number of its cirri, 12, and the size of its mouth. The adults of these 2 species can be readily distinguished, but the young of *B. recalvus* is very similar to the young of *B. globiceps*, indicating that *B. globiceps* is probably the ancestral form. Girard's old description of *Oligocottus globiceps* has been erroneously associated with this fish, which does not extend so far north as the type locality of *B. globiceps*. *B. recalvus* is distributed from San Diego to Santa Cruz, where it is immediately succeeded by *B. globiceps* on the north. No specimens of *B. recalvus* have been taken north of the region of Santa Cruz. On the other hand, several specimens of *B. globiceps* have been collected on the coast of Monterey County south of Monterey Bay, therefore within the range of *B. recalvus*. The relations between the two species where their ranges overlap is still to be made out. *B. recalvus* is quite common throughout its range and everywhere inhabits the deep shaded tide-pools, near low water mark, where a large number will often be found in a single pool. (Greeley.) (*recalvus*, bald in front.)

Centridermichthys globiceps, GÜNTHER, Cat., II, 171, 1860; not of Girard.
Oligocottus globiceps, JORDAN & GILBERT, Synopsis, 718, 1883.
Blennicottus globiceps, JORDAN & STARKS, Proc. Cal. Ac. Sci. 1895, 808; JORDAN & EVERMANN, Fishes of North and Middle America, II, 2017, 1898; not *Oligocottus globiceps* Girard.
Blennicottus recalvus, GREELEY, Bull. U. S. Fish Com. 1899 (Dec. 13, 1899), 9, fig. 1, Pacific Grove, Cal. (Type, No. 6068, L. S. Jr. Univ. Mus. Coll. Greeley & Cowles.)

746 (a). RUSCICULUS, Greeley.

Rusciculus, GREELEY, Bull. U. S. Fish Com. 1899 (Dec. 13, 1899), 13 (*rimensis*).

This genus is allied to *Oxycottus*, differing in the presence of minute prickly scales, which cover dorsal half of body. Preopercular spine simple, sharp. No slit behind the last gill. (*ruscum*, the butcher's broom, a rough-skinned plant.)

2384 (a). RUSCICULUS RIMENSIS, Greeley.

Head $3\frac{1}{2}$; eye 4 in head; snout $3\frac{1}{2}$ in head; D. IX–17 or 18; A. 14; P. 14; V. 1, 3. Body compressed, very slender, the caudal peduncle especially so; head compressed, flat; snout pointed; interorbital space $\frac{5}{6}$ eye, grooved; top of head flat and slightly concave; nasal spines large, blunt, snout abruptly decurved below them. Dorsal half of body covered with minute, embedded, prickly scales partially arranged in obscure

oblique rows, none below lateral line. Minute pointed teeth on jaws, vomer, and palatines; jaws subequal, mouth horizontal, the maxillary reaching a vertical below the anterior edge of pupil. Margin of preopercle armed with one sharp spine curved upward, below which are 1 and sometimes 2 very short blunt processes; margin of opercle ending dorsally in a pointed flap. Branchiostegals 6, the membranes broadly united, free from the isthmus; no slit behind the last gill. Dorsal fins not joined, the soft dorsal very large; first dorsal beginning slightly in advance of opercular flap, the upper edge much rounded, the fifth spine being longest; origin of soft dorsal just in front of origin of the anal in the female, directly above it in the male, the fin very long; pectoral large, reaching a vertical below ninth ray of soft dorsal; origin of ventrals posterior to a point midway between anal and base of pectoral in the male, anterior to it in the female, the difference caused by the enlargement of first 2 anal rays in the male; anal fin small, the rays slender, the membranes of all deeply emarginate; the first 2 anal rays of male greatly enlarged, joined by membrane to each other and to the rest of the fin; the posterior edge of tail nearly straight; anal papilla inconspicuous. Cirri small and scarce, always occurring singly, never in bunches or joined at the base, with the exception of a few pairs along the anterior third of the lateral line; one above each orbit, 2 rows of 3 each behind these on top of head, 1 cirrus on the inside of each nasal spine; a cirrus on the end of maxillary, 2 or 3 on the margin of the preopercle below the preopercular spine, and a row along the anterior half of the lateral line. Color, light olive or reddish brown tinged with lavender, marked dorsally with 4 or 5 wedge-shaped, indented spots of black, a broken band of same color along the lateral line, sometimes sending branches below it which show a tendency to inclose round spots; a more or less distinct spot of black on top of the head; a faint postocular line, a spot below the eye, and a preopercular line running from eye to snout, all of same color; pectoral and caudal indistinctly barred with brown, anal tinged with it, and the dorsal covered with fine brown or black spots sometimes very faint; throat and belly pale yellowish white, unspotted.

This species is most closely related to *Oxycottus embryum*, with which it agrees in general coloration, but differs decidedly in the presence of scales, the slenderer body, the larger number of soft dorsal and anal rays, the serrated margin of the preopercle, and the arrangement of the cirri. Rare; only 2 other specimens from Point Lobos, California, are known to us. It inhabits the tide-pools lined with corallines, and in its coloration imitates very closely these algæ. Length 40 mm. The smallest of our tide-pool fishes. (Greeley.) (*rimus*, a crevice; *rimensis*, living in crevices.)

Rusciculus rimensis, GREELEY, Bull. U. S. Fish Com. 1899 (Dec. 13, 1899), 13, fig. 3, Point Lobos, Monterey County, Cal. (Type, No. 6067, L. S. Jr. Univ. Mus. Coll. A. W. Greeley.)

746 (b). DIALARCHUS, Greeley.

Dialarchus, GREELEY, Bull. U. S. Fish Com. 1899 (Dec. 13, 1899), 14 (*snyderi*).

Preopercular spine forked at tip; scales none; first anal ray of male enlarged, joined to the second, the two widely separated from the rest of

the fin. Closely allied to *Oligocottus*, differing only in the character of the anal rays of the male.

(διαλόσ, divided; ἀρχός, anus.)

2384 (b). **DIALARCHUS SNYDERI**, Greeley.

Head 3¼; eye 4¼ in head; snout 3½; D. VIII–18 or 19; A. 13 to 15; P. 13 to 15; V. 1, 3. Body elongate, slender, the snout pointed, compressed; minute conical teeth on jaws, vomer, and front of palatines; jaws equal; mouth horizontal, the maxillary 3 in head, reaching a vertical below anterior edge of pupil. Interorbital space $\frac{5}{6}$ eye, shallowly grooved, the groove leading into a depressed space between the occipital ridges; nasal spines large. Margin of preopercle armed with a strong spine, ½ as long as eye, from the upper border of which at base extends a second spine pointing abruptly upward and inward; both spines covered with skin in life; margin of opercle ending in a pointed flap entirely unarmed. Branchiostegals 6, the membranes broadly united, free from the isthmus. Gills 3½, a slit behind the last gill. Dorsal fins large, separated by ½ diameter of eye, whole length equaling that from caudal to base of pectoral; first dorsal beginning slightly in advance of margin of opercle, upper edge nearly straight, curving abruptly downward from the sixth spine; origin of soft dorsal in advance of anal; pectoral large, reaching well beyond the origin of the anal; ventrals almost midway between base of pectoral and anal; anal fin small, rays all feeble in the female, in the male the first ray only greatly enlarged, joined to the second, the 2 distinctly separated from the rest of the fin, the membranes of all except the last 3 or 4 rays deeply emarginate. Anal papilla small, present in the male only. Cirri very numerous, usually occurring in bunches of 3 or 4, those of head joined at the base, forming a comb; 2 pairs of bunches above orbits, with the rudiments of a third bunch in front of these, 3 on top of head, behind orbits, 2 or 3 bunches just below these on side of head, 2 or 3 single cirri on margin of preopercle, a thick bunch above the preopercular spines, 4 or 5 on lower margin of opercle, with a thick bunch on its upper margin; a short row above the base of the pectoral; a row of bunched cirri along anterior two-thirds of lateral line, another well-defined row along the dorsal fin from the third spine to the sixteenth or seventeenth ray of soft dorsal, this row containing a bunch at the base of each spine and ray, with the occasional exception of the first ray; 5 or 6 scattered bunches between the dorsal and lateral rows on each side of body; a cirrus at the tip of each dorsal spine.

Color, light reddish brown, sometimes almost pink, thickly spotted with fine indistinct white spots; 4 or 5 irregular dark brown spots along the base of dorsal, a band of same color along lateral line, sometimes very much broken and extending ventrally, shading into the uniform reddish brown below, and including 3 or 4 round pinkish spots; a dark brown post-ocular line, another running forward from the eye, a patch of same color on top of head, another on side of head, and 2 or 3 on edge of opercle; throat reddish brown with several distinct white spots; belly bluish green; a silvery white patch between the bases of the pectorals; dorsal fins pale reddish brown with black and clear spots; pectoral

crossed irregularly with white; anal fin pale pink, crossed with dark brown. There are 2 or 3 perfectly distinct types of coloration, as follows: Some specimens from pools containing green algæ are pure light green, others from coralline pools are tinged with lavender, as *B. embryum*. This species resembles most closely *O. maculosus*, which name has been erroneously applied to it, but it differs markedly in its slenderer body, more pointed snout, the arrangement of the cirri, and the perfectly distinct coloration, also in the greater length of the dorsal fins, the enlargement of only one anal ray in the male, and the shortness of the maxillary. Coast of California.

Specimens are at hand from Crescent City, Cal., Bolinas Bay, Half Moon Bay, Monterey Bay, and San Luis Obispo, Cal. Found in all kinds of pools, from San Francisco to Monterey Bay, but nowhere common. Length 60 mm. The most beautiful and active of the tide-pool fishes, extremely variable in color. (Greeley.)

Centridermichthys maculosus, GÜNTHER, Cat., II, 171, 1860; not *Oligocottus maculosus*, Girard.

Oligocottus maculosus, JORDAN & GILBERT, Synopsis, 718, 1883; JORDAN & EVERMANN, Fishes of North and Middle America, II, 2013, 1898.

Oligocottus snyderi, GREELEY, in Jordan & Evermann, Fishes of North and Middle America, III, 2871, 1898, Pacific Grove, Cal. (Type, No. 5846, L. S. Jr. Univ. Mus. Coll. Greeley & Maddren.)

Dialarchus snyderi, GREELEY, Bull. U. S. Fish Com. 1899, 15, fig. 4.

946 (c) EXIMIA, Greeley.

Eximia, Greeley, Bull. U. S. Fish Com. 1899 (Dec. 13, 1899), 18 (*rubellio*).

Allied to *Oligocottus*, but differing in the presence of a large three-pointed preopercular spine instead of the simple forked spine of *Oligocottus*. Skin smooth. A slit behind the last gill.

2384 (c). EXIMIA RUBELLIO, Greeley.

Head $2\frac{5}{6}$; eye $3\frac{3}{4}$ in head; snout $3\frac{1}{4}$; D. VII or VIII–15 or 16; A. 12 or 13; P. 13 or 14; V. 1, 3. Body compressed, snout pointed and compressed, head deep, occiput narrow, slightly concave; interorbital space narrow, $\frac{1}{2}$ the large eye, shallowly grooved. Nasal spines prominent, very large and pointed. Teeth small, pointed on jaws, vomer and palatines; jaws equal, mouth horizontal, maxillary 3 in head, reaching a vertical below anterior edge of pupil. Margin of preopercle armed with a very strong spine as long as eye, extending backward and downward, bearing on its upper surface a second and third spine, both pointing back and up; all the spines covered with skin in life; opercle ending in a rounded flap. Branchiostegals 6, not united to the isthmus; gills $3\frac{1}{2}$, a slit behind the last gill. Anal papilla inconspicuous. Dorsal fins not joined; first dorsal beginning in advance of margin of opercle, first 2 spines short, the upper margin slightly rounded; soft dorsal beginning in advance of origin of anal, all the rays and spines very slender, pectoral reaching well beyond the origin of the anal; anal fin small, the rays slender, the membranes emarginate between each 2 rays: in the males the first ray enlarged, the second slightly elongated, the 2 united and not separated from the rest

of the fin, as in *Dialarchus snyderi;* ventrals situated below the upper edge of the base of the pectoral, just reaching the anus. Cirri all distinct, never joined at the base in a comb as in *Dialarchus snyderi;* 3 pairs of 2 or 3 cirri each above the orbits, the first directly above the nasal spines, 3 pairs on top of head behind orbits, a few scattered cirri below these on side of head, a bunch of 2 or 3 on end of maxillary, a row on lower margin of preopercle, a large bunch above the preopercular spines, and several scattered cirri on margin of opercle; a row of bunched cirri along the anterior half of lateral line, a row along the base of the dorsal, including a bunch of 3 or 4 for each spine and ray, the row bending downward at the last spine of the first dorsal, leaving a space between the cirri and the base of the dorsal spines; a few scattered cirri between the dorsal and lateral rows, and below the lateral line behind the pectoral fin. Color light brown to all shades of light red, pink, or lavender, spotted everywhere with white, the spots extremely minute on dorsal half of body, but more conspicuous ventrally; 5 wedge-shaped spots of dark brown along dorsal side of body; head dark brown, sometimes blotched with red or green, becoming lighter on side, leaving a dark postocular line extending from eye to the preopercular spine, and a dark spot on lower margin of preopercle, everywhere very finely marked with white and blue; a white spot with a brown center just in front of first dorsal; throat and belly a very light, bluish green, shading into a faint yellow behind pectoral, and a brownish green on each side of anal; all the fins, excepting the ventrals, light brownish green barred with dark brown; caudal light reddish brown, anal and tip of pectoral tinged with pinkish. A young individual is lighter and more brilliantly colored. This species is most closely allied to *Dialarchus snyderi,* from which it differs in the presence of a third preopercular spine, the greater depth and comparative length of the head, the larger eye and nasal spines, and the arrangement of the cirri. Many other specimens taken at Monterey Bay, but it is not recorded from any other locality. The most brilliantly colored of the tide-pool fishes, inhabiting only the deep pools rich in plant life. (*rubellio,* a rosy one.)

Eximia rubellio, Greeley, Bull. U. S. Fish Com. 1899 (Dec. 13, 1899), 18, fig. 5, Pacific Grove, Cal. (Type, No. 6066, L. S. Jr. Univ. Mus. Coll. Greeley & Maddren.)

Page 2027. *Gilbertina,* Jordan & Starks, is preoccupied in Lepidoptera. For its use in ichthyology Dr. Berg has substituted *Gilbertidia.*

Gilbertidia Berg, Com. del Museo Nac. de Buenos Aires, 1898 (Dec. 17, 1898), 43 (*sigolutes*).

Page 2207. After *Sicydium vincente,* Jordan & Evermann, insert:

2531 (b). SICYDIUM CAGUITE, Evermann & Marsh.

Head 4.4; depth 4.8; eye 5.75; snout 2.5; maxillary 2; mandible 2.75; interorbital width 3; preorbital 3.5; D. VI–I, 10; A. I, 9; scales 83–25; longest dorsal spine 1.5 in head, longest ray 2; longest anal spine 2 in head, longest ray 2; pectoral 1.1; ventral disk 1.75; caudal 1.

Body rather stout, heavy forward; head large, broad; mouth large, its width 1.5 in head; lips very thick; maxillary not greatly produced; teeth simple, flexible; a median cleft in upper lip; pectoral somewhat shorter

than head; dorsal spines without filaments, the longest about 1.5 in depth of body; space between dorsals about equal to orbit; soft rays of dorsal and anal scarcely reaching base of caudal; ventrals united, forming a cup-shaped disk, only about two-fifths posterior edge free from belly; caudal rounded. Scales very small, ctenoid, densely covering entire body except a broad strip on belly; posterior portion of nape with very fine scales; entire head naked.

Color: Dark brown or olivaceous on head, side, and back; under parts pale; fins all pale, the anal with a narrow darkish margin; caudal somewhat dark; no dark vertical bars on body and none at base of pectoral; no H-shaped figure at base of caudal.

This species is close to *S. plumieri*, from which it differs chiefly in the color, the more complete squamation, the shorter pectoral, and the non-filamentous character of the dorsal spines.

Puerto Rico. A single specimen, 3.63 inches long, obtained in the Rio de Caguitas at Caguas, January 9, 1899, by the U. S. Fish Commission expedition to Puerto Rico. (Named for the Rio de Caguitas, from which the type was obtained.)

Sicydium caguitæ, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 355, Rio de Caguitas, Caguas, P. R. (Type, No. 49364, U.S.N.M. Coll. Evermann & Marsh.)

Page 2230. After *Gobius oceanicus*, Pallas, insert:

2558 (a). **GOBIUS BAYAMONENSIS**, Evermann & Marsh.

Head 4.8; depth 6.4; eye 5; snout 3.2; maxillary 1.8; mandible 1.9; interorbital 7.6; preorbital 4.6; scales 71–19, about 29 before dorsal; D. IV–14, the longest spine about 0.7 in head, the longest ray 1.5; A. 15, the longest ray 1.5; pectoral 1.1; ventrals 1.1; caudal very long and pointed. Body very long and slender; head long; caudal peduncle long; mouth very large, oblique; maxillary long, reaching past posterior border of orbit.

Color as in *G. oceanicus*, which this species closely resembles. The smaller (71 instead of 63 to 65), almost cycloid scales, the longer head, larger mouth, longer maxillary, and the longer and more slender body are differences which we can not reconcile with the descriptions of that species or with the numerous specimens of it which we have from Puerto Rico.

Puerto Rico. Known only from the type, a specimen 9 inches long, obtained in the San Juan market January 14, 1899, by the U. S. Fish Commission expedition to Puerto Rico. It probably came from near the mouth of the Bayamon River at Palo Seco, for which stream the species was named.

Gobius bayamonensis, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 355, Mouth of Bayamon River, Palo Seco, P. R. (Type, No. 49365, U.S.N.M.; coll. Evermann & Marsh.)

Page 2218. To the synonymy of *Gobius soporator* add the following:

Gobius arundelii, Garman, Proc. N. E. Zool. Club, I, 63, June 9, 1899, Clipperton Island. (Type in M. C. Z.)

Page 2240. Before, *Aboma*, Jordan & Starks, insert:

2570 (a). BOLLMANNIA BOQUERONENSIS, Evermann & Marsh.

Head 4; depth 5.5; eye 3.5; snout 4.4; maxillary 2.2; mandible 2.5; interorbital width 3 in eye; preorbital 6; scales 27–8; D. VII–13, the longest spine 1.5 in head, the longest ray 1.2; A. 12, the longest ray 1.25 in head; pectoral 1; ventrals 1.1; caudal 0.4.

Body long, slender, tapering; head short; snout blunt; mouth large, oblique; jaws subequal, maxillary reaching posterior border of pupil; isthmus narrow, the gill-openings reaching forward to below preopercle; eyes large, high, close together, the interorbital very narrow and without median keel; no fleshy process on inner edge of shoulder girdle; teeth on jaws in narrow bands, those of outer series somewhat enlarged; opercle short, about 3 in head. Fins moderate; origin of spinous dorsal slightly behind base of pectoral, its spines 7 in number, not filamentous; interspace between dorsals less than diameter of eye; soft rays of dorsal and anal reaching, when depressed, beyond base of caudal; caudal long and pointed, as in *Gobius oceanicus;* pectoral pointed, reaching beyond origin of anal; ventral disk moderate, free from belly, the longest rays barely reaching origin of anal. Scales very large, weakly ctenoid; nape, cheek, and breast scaled, the scales somewhat smaller than on body, about 9 scales before the dorsal.

Color: Pale olivaceous or straw-color, back and upper part of head with profuse fine dark punctulations; under parts pale, breast somewhat dusky; dorsal fins barred with white and dark, a large jet-black ocellus on posterior part of spinous dorsal; other fins pale, the ventral disk somewhat dusky in front. The only known Atlantic member of the genus.

Length 2 to 3 inches. Puerto Rico. Known only from 5 specimens dredged by the U. S. Fish Commission expedition to Puerto Rico, off Puerto Real, in Ensenada del Boqueron, January 25, 1899. (Named for the type locality.)

Bollmannia boqueronensis, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 356, Ensenada del Boqueron, off Puerto Real, in 8.5 fathoms, at Fish Hawk station 6074. (Type, No. 49366, U.S.N.M. Coll. Evermann & Marsh.)

Page 2245. Before *Microgobius thalassinus*, Jordan & Gilbert, insert:

2575 (a). MICROGOBIUS MEEKI, Evermann & Marsh.

Head 3.75; depth 6; eye 3.5; snout 5.5; interorbital 7; preorbital 7; maxillary 2; mandible 1.5; scales 55–12; D. VII–17; A. 16.

Body slender, greatly compressed, tapering regularly from pectorals to caudal; head moderately heavy, interorbital space very narrow; eye large, high; mouth large, oblique; maxillary reaching posterior border of orbit; lower jaw projecting; teeth in bands in each jaw, the outer series greatly enlarged and strongly recurved, those of lower jaw largest; isthmus rather narrow, the gill-openings continue forward.

Body densely scaled, the scales strongly ctenoid, those anteriorly somewhat reduced; nape, breast, and entire head naked. Origin of spinous

dorsal from snout 3.5 in length; dorsals very close together; spines of first dorsal filamentous, exceeding head in length; soft dorsal and anal long, their bases about equal, about 2.5 in body, their last rays reaching past base of caudal when depressed; caudal pointed, its longest rays about equal to head; pectoral about equal to head, reaching origin of anal; ventrals united, almost reaching origin of anal.

Color: Light olivaceous, dusted over uniformly with fine dark punctulations; a large dark shoulder spot between the base of pectoral and origin of spinous dorsal; a few indistinct dark areas on side of head; lower jaw dark at tip; an obscure dark blotch at base of caudal; fins all rather pale except ventrals, which are dark, perhaps bluish in life; caudal somewhat dusky; anal dark-edged. Length 1.5 inches.

This species seems related to *M. eulepis*, Eigenmann & Eigenmann, described from Fortress Monroe, Va., but differs in the smaller and strongly ctenoid scales, greatly compressed body, and in the coloration.

Puerto Rico; known only from the type, 1.5 inches long, dredged by the U. S. Fish Commission expedition to Puerto Rico, February 8, 1899. (Named for Dr. Seth Eugene Meek, assistant curator of zoology, Field Columbian Museum.)

Microgobius meeki, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 356, between Vieques and Culebra islands at Fish Hawk station 6087, in 15.25 fathoms. (Type, No. 49367, U.S.N.M. Coll. Evermann & Marsh.)

Page 2350. After *Enneanectes carminalis* (Jordan & Gilbert), insert:

868 (b). **GILLIAS**, Evermann & Marsh.

Gillias, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 357 (*jordani*).

Body short and stout, tapering rapidly from the short, broad head to the short, compressed caudal peduncle; scales large, rough-ctenoid; lateral line complete, or nearly so, broken under last spines of middle dorsal; a broad, double-pointed tentacle above eye; dorsal fin divided into 3 parts, the first of 3 short spines, the second of 11 longer spines, and the third of 7 rays.

This genus is closely related to *Enneanectes*, Jordan & Evermann, from which it differs in the presence of the orbital tentacle, the more complete development of the lateral line, and the larger scales.

(Named for Dr. Theodore Gill.)

2687 (b). **GILLIAS JORDANI**, Evermann & Marsh.

Head 3.5; depth 4.3; eye 2.5; snout 3.5; maxillary 2.4; mandible 1.9; scales 2-30-7; D. III-XII-7; A. II, 15; longest dorsal spine 1.8 in head, longest ray 1.6; longest anal ray 2.3; pectoral 0.8; ventral 1.3; caudal 1.3.

Body short and stout, tapering rapidly to the short, compressed caudal peduncle; head short; snout short; blunt, concave in front of eyes; mouth small, slightly oblique, jaws equal; eye large, high up, interorbital width very narrow; a broad bifid orbital tentacle, none on nape. Scales very large and rough-ctenoid; opercles and entire head rough; lateral line nearly complete, beginning immediately above base of pectoral at upper end of gill-opening and extending parallel with back to posterior

part of middle dorsal fin (or for 12 scales) where there is a break, the line dropping down 3 scales, then continuing with one or two interruptions to base of caudal; belly and breast scaled; dorsals 3, the first of 3 short, flexible spines, close to the second, which has 12 longer, rather stiffer, spines, separated from the third by a space one-third diameter of eye; anal long and low, the membranes deeply notched between the rays; pectoral of 15 rays, broad and short, reaching posterior end of second dorsal; ventral 2, slender.

Color in alcohol: Brown, body crossed by 4 broad blackish bars, one at the origin of second dorsal, one under last spines of same fin, the third between second and third dorsals, and the fourth under third dorsal; an inky-black bar across caudal peduncle at base of caudal fin; head and under parts rusty; fins all barred with light and dark; caudal with a narrow light bar at base, then a black one, then a broader white one, followed by a much broader dark bar containing some white areas, the fin finally tipped with white. Puerto Rico. Two specimens of this well-marked and interesting species were obtained by the U. S. Fish Commission expedition to Puerto Rico, the type 1.5 inches long (No. 49368, U.S.N.M.), taken on the Cardona Light-House Reef, at Ponce, February 1, 1899, and another specimen of about the same size taken at the same place the preceding day.

(Named for Dr. David Starr Jordan.)

Gillias jordani, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 357, Cordona Light-House Reef, Ponce, P. R. (coll. Evermann & Marsh.)

Page 2357. After *Malacoctenus lugubris* (Poey), insert:

2696 (a). **MALACOCTENUS CULEBRÆ**, Evermann & Marsh.

Head 3.35; depth 5; eye 4.2; snout 4.5; maxillary 2.2; mandible 1.8; interorbital 6.5; scales 2-35-11; D. xxi, 8; A. ii, 18; pectoral 1.3; ventral 1.3; caudal 1.4.

Body slender, compressed; head rather long, pointed, upper profile convex; mouth large, the maxillary nearly reaching posterior border of orbit; lips thick, jaws equal; teeth very small, conical, a single row in each jaw; a single nasal, ocular, and nuchal filament; dorsal fin moderately high, originating above the origin of lateral line, a shallow notch in front of last two dorsal spines, the membrane free from caudal; anal origin under about tenth dorsal spine; caudal somewhat pointed; pectoral large, reaching anal; ventrals moderate, not reaching anus, of two rays, no spine evident; lateral line distinct throughout, running high anteriorly, where it is slightly curved, turning abruptly downward over the origin of anal, thence median to base of caudal.

Color in spirits: Body everywhere mottled with dark brown, in somewhat regularly arranged blotches; a series of about nine of these at the base of dorsal, barely extending upon the fin; a similar series of much smaller ones at base of anal, not evident on all specimens; below the series at base of dorsal are two other series of the same blotches less deep in color and not so well defined, extending the length of body and sometimes forming, with the upper series, more or less broken vertical bars;

between the blotches a lighter shade of brown is interwoven with pale streaks of ground color; head nearly pale below, save some dark on chin and isthmus; two wide streaks from eye across cheek; opercle dark brown; top of head with the color of body; lips with brown and pale stripes; posterior half of maxillary pale; dorsal rather dark; caudal uniform gray or faintly barred; anal similar to dorsal in color; the rays with pale tips forming a white edge; pectoral like caudal; ventrals pale. Length about 1.5 inches.

A plainly marked species most closely related to *M. lugubris* (Poey). Puerto Rico; only 3 specimens known, all from the coral reefs about Culebra Island, February 9, 1899.

(Named for the type locality.)

Malacoctenus culebræ, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 357, Culebra Island. (Type, No. 49369, U. S. N. M. Coll. Evermann & Marsh.)

Page 2358. After *Malacoctenus gillii* (Steindachner), insert:

2697 (a). MALACOCTENUS MOOREI, Evermann & Marsh.

Head 3.6; depth 3.7; eye 3.5; snout 3.4; maxillary 4.5; mandible 4.5; interorbital 4; scales 3–45–5. D. xxii, 11; A. ii, 20; pectoral 1 in head; ventral 1.2; caudal 1.2; longest dorsal spine 1.5, ray 1.2; longest anal ray 1.5.

Body short, rather stout, compressed; head short, snout short, but pointed; mouth rather small, little oblique, the gape scarcely reaching orbit; teeth in each jaw in a single series; gill membranes broadly united across the isthmus; eye small, interorbital space wide; dorsal outline rising abruptly to above eye, thence gently curved to origin of dorsal fin, and from there nearly straight to base of caudal fin; ventral outline regularly convex.

Color in alcohol: Light olivaceous, the body crossed by about 9 or 10 broad dark vertical bars, which extend upon dorsal fin, these usually broadest above, the pale interspaces therefore broadest on lower half of body; the fourth from last is a narrow dark line, the one following it is a double spot, the next narrow and indistinct, the last, at base of caudal, more distinct, followed by 3 small irregular white spots; top of head brown; side of head with fine punctulations; a dark line running forward from eye, a dark spot below eye, 2 or 3 dark blotches on anterior edge of opercle; under surface of head crossed by 3 or 4 irregular, indistinct dark lines; caudal and anal with fine dusky punctulations; pectoral and ventrals pale.

This species is close to *M. gillii*, from which it may be distinguished by the larger dorsal and anal fins, the greater depth, wider interorbital, and the coloration.

Puerto Rico; known only from the type, 1.4 inches long, obtained by the U. S. Fish Commission expedition to Puerto Rico, February 11, 1899.

(Named for Dr. H. F. Moore, naturalist on the U. S. Fish Commission steamer *Albatross*.)

Malacoctenus moorei, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 358, Culebra Island. (Type, No. 49370, U.S.N.M. Coll. Evermann & Marsh.)

Page 2358. After *Malacoctenus bimaculatus* (Steindachner), insert:

2697 (b). MALACOCTENUS PUERTORICENSIS, Evermann & Marsh.

Head 3.4; depth 3.4; eye 4; snout 3.5; maxillary 3.4; mandible 2.6; interorbital 7; preorbital 8; scales 4–44–8. D. xx, 10; A. ii, 19; P. 14; V. 2; C. 13.

Body short, stout, compressed; head rather long, snout long and pointed; mouth small, little oblique, the maxillary scarcely reaching front of orbit; teeth in a single row in each jaw; gill-membranes broadly united, free from the isthmus; eyes high up, interorbital narrow; caudal peduncle short, compressed, its least depth about 3 in head. Fins rather large; origin of dorsal over upper end of gill-opening, first spine slightly shorter than second, which is somewhat longer than the third, whose length is about 2.2 in head; no notch behind third and fourth spines, all the spines from third to fifteenth being about equal in length, the sixteenth and seventeenth being somewhat shorter, the remaining three progressively longer; soft dorsal higher, its longest ray about 1.7 in head; longest anal ray 1.7; pectoral broad, 1.25 in head, reaching anal; ventral barely reaching origin of anal; a pair of slender ocular cirri, a small supraocular one, a short, slender, nasal cirrus and a few very slender ones at the nape; scales large, not crowded anteriorly; lateral line well arched above the pectoral.

Color in alcohol: Brown, much spotted and vermiculated with darker; top of head brown, sides and under parts pale, crossed by about 5 broad, irregular brown bars; side of body with about 5 or 6 broad, dark crossbars, broader than the paler interspaces, broadest and darkest above and extending upon dorsal fin; under parts of body paler, more speckled; spinous dorsal with numerous small brown specks, a large, black ocellus on base of 3 anterior spines, and a larger one on base of last 4 dorsal spines, being chiefly on body; soft dorsal, caudal, and anal each crossed by several series of small brown spots; pectoral and ventrals pale, the pectoral with a few brown spots at base.

The above description from the type, a female, 2.5 inches long, obtained at Hucares, February 14. Three female cotypes gotten at Fajardo, February 17, and one at Culebra, February 9, agree closely with the type; 2 of these, however, show faint traces of narrow horizontal lines along lower part of side.

A male, 2.5 inches long, from Culebra, February 11, taken as one of the cotypes, may be described as follows: Head 3.5; depth 3.7; eye 3.8; snout 3.2; maxillary 3.1; mandible 2.4; interorbital 7; preorbital 6.2; scales 3-45-9; D. xx, 10; A. ii, 19; P. 14; V. 2; C. 13; longest dorsal spine 2 in head, longest ray 1.4; longest anal ray 1.5; pectoral 1; ventral 1.1; caudal 1.1. Color in alcohol, tolerably uniform brown; crossbars on side very faint; longitudinal lines more evident than in the female; throat and under parts of head mottled with white and light brown; fins less speckled than in female, the soft dorsal and anal pale, almost without spots.

Another male, 2.25 inches long, from Culebra, February 11, agrees with

the large specimen just described, except that the crossbars on body are more distinct.

This species most closely resembles *M. bimaculatus* Steindachner, from which it differs in the larger head, greater depth, smaller mouth, narrower interorbital, and in the color. The tips of the anal rays are not white, the soft dorsal is spotted like the caudal and anal, and there are no white spots on base of pectoral, as is said to be the case in *M. bimaculatus*.

Puerto Rico; known from the 7 specimens mentioned above, all obtained by the U. S. Fish Commission expedition to Puerto Rico.

Malacoctenus puertoricensis, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19 1899), 358, Hucares, P. R. (Type, No. 49371, U.S.N.M. Coll. Evermann & Marsh.)

Page 2369. Before *Auchenopterus*, Günther, insert:

878 (a). **AUCHENISTIUS**, Evermann & Marsh.

Auchenistius, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 359 (*stahli*).

This genus has the form of *Auchenopterus* and suggests that genus strongly. It differs in the absence of a lateral line, in the much smaller scales, in the absence of a notch at the front of the dorsal fin, and in the union of the membrane of the anal fin with that of the caudal.

(*αὐχήν*, nape; *ἱστίον*, sail or fin.)

2711 (a). **AUCHENISTIUS STAHLI**, Evermann & Marsh.

Head 5; depth 6.5; eye 4.8; snout 6; maxillary 2.8; scales about 58, about 12 in transverse series; D. XLI or XLII; A. II, 23 or 24; pectoral 2.5; ventral 2.2; caudal 1.3.

Body elongate, somewhat compressed, especially posteriorly, the dorsal and ventral outlines alike; head small, upper profile straight and descending; snout moderate, pointed; mouth large, the maxillary reaching to or beyond middle of eye; the jaws equal, heavy and projecting; teeth in lower jaw conical, short and strong, slightly recurved, in one row; teeth in upper jaw similar to those in lower, but a small patch of smaller teeth in front of jaw behind the main row; teeth on vomer; gill-membranes joined to the isthmus; nostrils with short tubes, a single flap above each eye and one on each side of nape; dorsal fin long, of spines only; last four spines somewhat longer than the preceding, forming a shallow notch, a feature lacking in the other examples; anal origin about midway between tip of snout and tip of caudal, the fin similar to dorsal in shape, but somewhat lower; membrane of dorsal and anal joined to caudal; caudal small, pointed; pectoral small, of 8 rays; ventral small, of 2 rays.

Color in spirits; Body everywhere with a very slight yellowish tinge, in some specimens a faded gray; one specimen has traces of 10 or 12 dark crossbars; fins all pale, in one case with the dorsal and anal dark-edged.

Puerto Rico; known from the type, a specimen 1.2 inches long, obtained by the U. S. Fish Commission expedition to Puerto Rico, February 1, 1899, at Ponce, and 13 cotypes, 8 from the coral and algæ on the reefs at the mouth of Culebra harbor, and 5 from Puerto Real.

("Named for Dr. A. Stahl, of Bayamon, Puerto Rico, who, under many difficulties put in his way by Spanish authorities, made important collections of natural history objects of that island.")

Auchenistius stahli, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 359, Ponce, P. R. (Type, No. 49372, U.S.N.M. Coll. Evermann & Marsh.)

Page 2373. Before *Auchenopterus fasciatus* (Steindachner), insert:

2717 (a). **AUCHENOPTERUS ALBICAUDUS,** Evermann & Marsh.

Head 3.2; depth 4; eye 4; snout 4.1; maxillary 2.2; mandible 1.6; interorbital 5.3; D. XXX, 1; A. II, 17; pectoral 1.4; ventral 1.5; caudal 1.6; branchiostegals 6; scales 1–34–6.

Body rather short, compressed; dorsal outline not elevated; head moderate, not broad; snout short, pointed; mouth large, oblique, maxillary extending to below middle of eye; lips broad, prominent; a band of conical teeth on each jaw, those on side somewhat enlarged and recurved; a patch of teeth on vomer, none on palatines; gill-membranes broadly united, free from isthmus; eye large, high up; nasal, supraocular, and nuchal regions with fringed tuft-like cirri; a considerable notch between fourth and fifth dorsal spines, but not reaching base of membrane; longest anterior spine scarcely as long as those of the posterior portion; scales large, reduced anteriorly; lateral line anteriorly separated from the dorsal fin by only one scale; head naked.

Color: Uniform dark brown on head and body, no dark crossbars; dorsal brown, mottled with lighter, narrowly edged with white; a black spot upon anterior 3 or 4 spines and a large black ocellus upon posterior portion of fin between twenty-second and twenty-fourth spines; anal rather darker, with narrow white edge; caudal peduncle black, the fin abruptly white at base, the entire fin being clear white, entirely without specks; pectoral black at base, then barred with white and dark; ventral black at base, the outer two-thirds barred with black and white.

This species seems to be related to the Pacific-coast species, *Auchenopterus integripinnis*, which it closely resembles, but differs from that species in the larger scales, the deeper body, and the coloration.

Puerto Rico; known only from the type, a specimen 1.5 inches long, obtained by the U. S. Fish Commission expedition to Puerto Rico, February 4, 1899.

(*albus*, white; *cauda*, tail.)

Auchenopterus albicaudus, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 360, Arroyo, P. R. (Type, No. 49373, U.S.N.M Coll. Evermann & Marsh.)

2717 (b). **AUCHENOPTERUS RUBESCENS,** Evermann & Marsh.

Head 3 4; depth 5; eye 5; snout 3.8; maxillary 2.6; interorbital 5.8; scales 2–32–8; D. XXX, 1; A. II, 18; pectoral 1.5; ventral 2; caudal 1.4.

Body slender and compressed; head moderate, somewhat compressed above; snout pointed; mouth moderate, the jaws equal, the maxillary about reaching front of pupil; lips, especially the upper, prominent; teeth small, conical and sharp, in both jaws, in a numerous patch on front of

upper jaw, fewer on sides; in lower jaw less numerous in front, a long single row of somewhat stronger teeth on sides; eye not large; a small nasal flap, and a 3- or 4-branched tentacle over eye and one at nape; scales rather large and regularly arranged; dorsal fin with a notch behind third spine, and with one unbranched soft ray at its end, the membrane joined to caudal; origin of anal under eleventh dorsal spine; lateral line as usual in *Auchenopterus*.

Color in spirits: Everywhere a nearly uniform faded pink, save breast and lower side of head, which are paler; a small, inconspicuous dark round spot on dorsal fin, at twenty-third and twenty-fourth spines, a little nearer base than margin, and made up of very small black punctulations; indications of a yellow tinge on front of dorsal and base of anal in life; fins otherwise all pale.

Puerto Rico; known only from the type, a specimen 1.3 inches long, obtained by the United States Fish Commission expedition to Puerto Rico January 27, 1899. (*rubescens*, reddening.)

Auchenopterus rubescens, Evermann & Marsh, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 360, Puerto Real, P. R. (Type, No. 49374, U.S.N.M. Coll. Evermann & Marsh.)

2717 (c). **AUCHENOPTERUS CINGULATUS**, Evermann & Marsh.

Head 3; depth 4.4; eye 5; snout 4.2; maxillary 2.2; interorbital 6; scales 2-29-7; D. IV-XXIV, the longest spines 3 in head; A. II, 16, the longest ray 2.25 in head; pectoral 1.3; ventral 1.8; caudal 1.6. Body rather long and slender, strongly compressed; head large, little compressed; snout moderately sharp; mouth large, maxillary reaching posterior border of eye, the lips heavy, the jaws subequal or the lower very slightly projecting; teeth conical and sharp, in more than one row in each jaw, most numerous in front; a patch on vomer; a nasal filament, a 3- or 4-branched supraocular tentacle, and a 4-branched nuchal tentacle, the branches of the latter each with a dark dot on their anterior surface. Dorsal originating over edge of preopercle, of spines only, the second slightly longer than first; second, third, and fourth graduated, the fourth comparatively short, thus forming a notch partly separating the first 4 spines from rest of fin; dorsal membrane joined low with caudal; anal free from caudal, about as high as dorsal, its thirteenth and fourteenth rays longest; first anal spine under tenth or eleventh dorsal spine; caudal rounded, shorter than head, of about 13 rays; pectoral large, reaching anal, of 12 rays; ventrals moderate, of 2 rays, the spine not evident. Lateral line running high to eleventh dorsal spine, here abruptly decurved two rows of scales, thence median to base of caudal.

Color in spirits: Body and head pale yellow; body with 4 heavy dark-brown vertical bars, each about 4 rows of scales wide, extending on the vertical fins; membrane of anterior dorsal spines, opercle, occipital, and scapular region blotched with the same color; a dark bar backward and downward from eye across cheek, rather more than one-half width of eye; top of head between and behind eyes darkened; preorbital, maxillary, lips, and under part of head thickly punctulate with dark; dorsal and anal barred with the extensions of the wide dark body bars, and with the

alternating narrower pale interspaces; caudal mottled or irregularly barred with grayish, its base with the plain pale-yellow ground color, which is sharply separated from the rest of the fin by a curved dark line; posterior half of pectoral barred with dark formed of dots on the rays, the first bar plainest; basal half of pectoral pale; ventral with basal portion dark, the rest barred like pectoral.

A pretty and strongly marked blenny, known only from Puerto Rico, where 4 specimens were obtained on the coral reefs at Ponce and 1 at Puerto Real by the U. S. Fish Commission expedition to Puerto Rico.

(*cingulatus*, banded, from the conspicuous vertical bars.)

Auchenopterus cingulatus, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 361, Ponce, P. R. (Type, No. 49375, U.S.N.M. Coll. Evermann & Marsh.)

2717 (d). **AUCHENOPTERUS FAJARDO**, Evermann & Marsh.

Head 3.25; depth 4.8; eye 4.2; snout 4.8; maxillary 1.7; mandible 1.5; interorbital 5.5; scales 2–37–8; B. XXIX, 1, the longest spine 2.3 in head; A. II, 17; pectoral 1.4; ventral 1.7; caudal 1.4. Body elongate, strongly compressed posteriorly; head moderate, little compressed; mouth large, the long and slender maxillary reaching beyond the posterior border of orbit; jaws subequal; teeth of upper jaw conical and sharp, in a patch in front, becoming one row posteriorly; teeth in lower jaw similar, but fewer and weaker; vomerine teeth in two series. Nasal, ocular, and nuchal tentacles present, all but the nasal about 5-branched. Dorsal origin over edge of preopercle, the first 4 spines graduated, the fourth shortest, thus forming a notch; dorsal ending with an unbranched soft ray, the joints visible under a strong lens; membrane of dorsal joined low to caudal; anal origin under eleventh dorsal spine and the decurved portion of lateral line; pectoral reaching past front of anal; ventral moderate, of 3 rays, the innermost shorter and slenderer.

Color in spirits: Body and head light reddish, becoming a little paler posteriorly; body with traces of 6 or 8 dark vertical bars extending on the fins, their margins ill defined; breast pale, 2 dark reddish bars downward and backward from eye across upper and lower edge of cheek to opercle; maxillary blotched with dark; upper lip and tips of both jaws dark; lower part of head spotted with dark; a row of about 5 small dark spots on edge of preopercle; iris pink; dorsal and anal fins gray, except for the extensions of the dark bars of the body and a few white spots on the dorsal; a distinct ocellus on the twenty-second, twenty-third, and twenty-fourth dorsal spines and their membranes; base of caudal gray, like the ground color of dorsal and anal; posterior part of caudal with gray mottlings on the rays only, this portion separated from the basal part by a space without pigment on rays or membrane, making a distinct vertical bar; pectoral and ventrals mottled. Puerto Rico.

A handsomely colored blenny, known only from the type, 1.63 inches long, collected February 17, 1899, by the the U. S. Fish Commission expedition to Puerto Rico. (Named for the type locality.)

Auchenopterus fajardo, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 361, Fajardo, P. R. (Type, No. 49376, U.S.N.M. Coll. Evermann & Marsh.)

Page 2400. Before *Ophioblennius*, Gill, insert:

893 (a). **CORALLIOZETUS**, Evermann & Marsh.

Coralliozetus, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 362 (*cardonæ*).

Body slender and strongly compressed, without scales; head large, subcylindrical, bluntly pointed; mouth large; teeth not hooked, about 8 enlarged conical ones in front of each jaw, smaller ones behind; vomer with teeth; dorsal fin with a notch between the rays and spines, the membrane connected with caudal; caudal fin rounded; pectoral large, ventrals small and inserted slightly in advance of pectorals. A strongly marked genus, conspicuous in appearance by its heavy head and thin body, probably related to *Ophioblennius*, from which it is technically separated by the absence of hooked canine teeth, the convex caudal, and the entire absence of a lateral line.

(κοράλλιον, coral; ζητέω, I seek.)

2753 (a). **CORALLIOZETUS CARDONÆ**, Evermann & Marsh.

Head 4; depth 5.6; eye 5; snout 4; maxillary 2; D. XVII, 11; A. 21; pectoral 1.3; ventral 1.8; caudal 1.4.

Body scaleless, slender, much compressed; head large and heavy, not compressed nor depressed; snout very short and blunt; mouth large, horizontal, low in position, the maxillary reaching far beyond the eye; eyes small, close together, placed high and well forward; teeth conical, in a patch on the front of each jaw, an outer row of about 8 teeth (4 on a side) in each jaw, much enlarged; a single row of smaller teeth on sides of each jaw; teeth on vomer; a small flap at the nostril and two short filaments above eye, one much the smaller; no appendages at the nape. Dorsal fin long and high, of slender, flexible spines, and longer soft rays, a notch between the soft and spinous portions; anal longer and lower than soft dorsal; anal and dorsal free from caudal; caudal rounded; pectoral large, wide as body, reaching anal or beyond; ventral small, inserted before pectoral, of 3 rays, the innermost very slender.

Color in spirits: Body dark red, much paler in one specimen; head everywhere inky, this color dusted upon the body, particularly on the anterior portion; a pale gray bar downward and backward across cheek; fins pale, except ventrals and front of dorsal, which have color of head; a row of small rosy spots along bases of anal rays, seemingly in the flesh; sometimes a similar fainter row along base of dorsal. Known only from Puerto Rico, where 3 specimens, each about 1 inch long, were obtained in February, 1899, by the U. S. Fish Commission expedition to that island.

(Named for Cardona, a little islet off Playa de Ponce, on the reef of which the type was collected.)

Coralliozetus cardonæ, EVERMANN & MARSH, Rept. U. S. Fish Com. 1899 (Dec. 19, 1899), 362, Cardona Islet, P. R. (Type, No. 49377, U.S.N.M. Coll. Evermann & Marsh.)

Page 2471. After *Lycenchelys paxillus* (Goode & Bean), insert the following:

2833 (a). **LYCENCHELYS MURÆNA** (Collett).

Head nearly 8; depth about 20; eye 4.5; D. 112 (including one-half of caudal, 118); A. 95 (101); P. 13. Body everywhere scaled, head and fins naked; ventrals comparatively close together, 6 times length of pectoral; jaws with teeth in a single series. Lateral line present, but difficult to trace in its entirety; from upper angle of gill-opening a series of rather closely placed, very small pores (connected by a narrow line) descends in a curve to a short distance behind vent; after having reached nearly to base of anal, it runs for a short distance nearly horizontally, whereupon it ceases, or can not be followed in the same direction with certainty; another lateral line, however, begins about over the vent, and runs horizontally along median line, becoming obsolete toward end of tail; the pores herein are very small and more widely separated, and can be seen only by close observation; the short whitish line which runs through each pore forms here no accompanying line. Length 7 to 11 inches. North Atlantic. Recently taken by the *Ingolf* expedition in Denmark Strait.

Lycodes murœna, COLLETT, Lorh. Selsk. Christ., No. 14, 15, 1878, off Traenen, in Helgeland, Norway; Lütken, *Ingolf* Expedition, 20, 1898.
Lycenchelys murœna, GOODE & BEAN, Oceanic Ichth., 309, 1896.

Page 2578. *Chalinura simula*, Goode & Bean, was taken by the *Ingolf* in Denmark Strait in 912 to 1,236 fathoms.

Page 2587. Before *Cœlorhynchus*, Giorna, insert the following:

2963 (a). **MACROURUS INGOLFI**, Lütken.

The head is contained about 5 times in the total length. The superior or frontal surface of the snout is separated from the inferior or more forwardly directed part by a well-developed crest or edge, terminating in 3 spinose osseous tubercles, 1 directly in the middle and 1 on each side, close before the naked spot, where the nostrils have their place, and continued both above and below the orbits. The broadly triangular snout is prolonged fairly over and before the mouth, which is relatively little, the corners of the mouth falling in a line with the anterior margin of the middle of the orbits. The eyes are large, their diameter surpassing the breadth of the front between the eyes. The teeth form a fine card in both jaws. The head is scaled with the exception of the gill-membrane, the isthmus, and its foremost superior margin, and almost the whole lower surface. The naked part of the snout is handsomely embroidered with rows of slime glands. The first dorsal, counting 11+9 rays, is singularly high and its longest (second) ray is serrate and as long as the head. The second dorsal begins much forward, its foremost rudimentary rays may be followed until not far from the posterior margin of the first dorsal fin. The pectoral contains 20 rays, and the ventrals, whose external ray tapers to a fine thread and reaches a long stretch beyond the anus, have 8 rays. It may also be remarked that the tail, as in other Macrurians, is really

pointed behind, but in several specimens has lost a shorter or longer part; but the wound has healed, and on the thus truncated point of the tail is developed a distinct caudal fin, a phenomenon which is also observed in some specimens of the preceding species. The scales show distinct rows of thorns, not however so much projecting as in *M. goodei*. (Lütken.)

Several specimens taken by the *Ingolf* about Iceland and in Denmark Strait.

Macrurus ingolfi, LÜTKEN, Ichth. Results Danish *Ingolf* Exped., 27, 1898, south of Iceland.

Page 2622. After *Hippoglossina bollmani*, Gilbert, insert the following:

2988 (a). **HIPPOGLOSSINA SABANENSIS**, Boulenger.

Head 4; depth 1⅔; eye 5; width of mouth 2¾ in head; maxillary reaching posterior third of eye; teeth small, more strongly developed on right side; eyes moderately large, the lower a little in advance of the upper; interorbital space tectiform, scarcely half the width of eye. D. 76; A. 63. Gill-rakers very short, tuberculous, 6 on lower arm of first gill-arch; dorsal commencing above anterior third of upper eye, its longest ray 2 in head; left pectoral a little longer than right, 1⅔ in head; left ventral twice as long as right, equaling the head; caudal a little shorter than head, its free edge forming a wide angle, the middle rays more than half longer than the outer; depth of caudal peduncle twice it length; scales 33–110–40, strongly ciliate on both sides; lateral line strongly arched above the pectoral. Deep gray brown; 3 large black ocelli bordered with bluish, 2 superposed on middle of body, equally distant, between lateral line and vertical fin, the third on lateral line a little in front of caudal peduncle; pectoral yellowish, ventrals blackish. Length 230 mm. One specimen from Rio Sabana, Darien. (Boulenger.) (*sabanensis*, from the Rio Sabana.)

Hippoglossina sabanensis, BOULENGER, Bollettino dei Mus. di Zool. ed. Anat. Comp. della Univ. di Torino, Vol. XIV, No. 346, 4, April 29, 1899, Rio Sabana, Darien. (Coll. Dr. Enrico Festa.)

Page 2789. *Villarius*, Rutter=*Haustor*, Jordan & Evermann. All species of *Ameiurus* have villi.

Page 118. Dr. Albert Günther has recently critically studied the Linnæan type specimens of American fishes in the possession of the Linnæan Society of London, and the results are published in the proceedings of that society for May 24, 1899.

These studies of Dr. Günther necessitate the following changes from the names adopted by us in the earlier parts of this work: The Gaff-Topsail Catfish becomes

161. **FELICHTHYS FELIS** (Linnæus).

The species called by us *Hexanematichthys felis* (Linnæus) (p. 128) becomes

186. **GALEICHTHYS MILBERTI** (Cuvier & Valenciennes).

The Red Hind, given by us as *Epinephelus maculosus* (p. 1158), becomes

1553. EPINEPHELUS GUTTATUS (Linnæus).

The Spotted Jewfish, given as *Promicrops guttatus* (p. 1162), becomes

1557. PROMICROPS ITAIARA (Lichtenstein).

Page 261. After *Notropis heterodon* (Cope), insert:

406 (a)'. NOTROPIS CALIENTIS Jordan & Snyder.

Head 3.66 in length; depth 3.33; eye 4 in head; snout 4; interorbital space 2.66; depth of caudal peduncle 2.40; height of dorsal 4.66 in length; anal 5.75; length of pectoral 5.66; ventral 6; caudal 3.83; scales in lateral line 33; between dorsal and occiput 15; between dorsal and ventral fins 10; D. 8; A. 7. Body deep and wide, deepest part anterior to insertion of dorsal; caudal peduncle long and slender; snout blunt, rounded; mouth oblique; jaws equal; maxillary reaching to a vertical from posterior nostril. Teeth 4–4, slender, hooked, grinding surface narrow, absent on smallest tooth. Gill-rakers short, blunt; 9 on first arch. Intestinal canal short, with but 1 convolution; peritoneum white, scales large, not notably deeper than long; lateral line incomplete, extending only as far as posterior edge of pectoral. Dorsal fin rounded, the second, third, and fourth rays longest; anal fin similar in shape; ventral rounded, extending to vent, inserted directly under dorsal; pectoral rounded; caudal forked, the lobes rounded.

Color silvery, an indefinite dark band extending from tip of snout to end of caudal peduncle; the band distinct on snout and caudal peduncle, broader and almost obsolete on middle of body; top of head and a narrow band on median dorsal part of body dark; ventral parts of body immaculate, except a narrow, dark band extending along base of anal and ventral part of caudal peduncle; chin white; scales on upper parts with dark edges; dorsal and caudal fins slightly dusky; other fins lighter.

This species is of small size, the mature males measuring about 34 mm. in length of body; the females 43. The males are more slender and have a little less dark color on the body. The affinities of *Notropis calientis* are with *Notropis cayuga, jordani,* and others of the subgenus *Chriope.* The species may be distinguished by its small eye, short, rounded snout, deep body, short lateral line, and rounded fins. (Jordan & Snyder.)

Lake Chapala basin, Mexico.

Notropis calientis, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 122, Rio Verde, at Aguas Calientes, Mexico. (Type, No. ——, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Page 965. The generic name *Rhombus* was first used by Humphreys in 1797 for a genus of mollusks, and can not therefore be used in fishes. Its place in fishes will be taken by *Peprilus* Cuvier (1817).

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ampullaceus, Saccopharynx	LXVI, 175	406
Anableps dovii	CXIII, 300	685
analis, Hypocritichthys	CCXXX, 582	1500
Neomænis	CXCVIII, 517	1265
Notacanthus	XCVIII, 264	615
Anarrhichas latifrons	CCCXLVI, 845	2446
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ancylodon, Sagenichthys	CCXXI, 564	1416
Ancylopsetta quadrocellata	CCCLXXV, 925	2634
Angelichthys ciliaris	CCLIV, 626, 626*a*	1684
Anguilla chrysypa	LV, 143	348
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anguillaris, Zoarces	CCCXLVIII, 850	2457
Anisotremus bilineatus	CCVIII, 538	1319
surinamensis	CCVIII, 537	1318
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annularis, Pomoxis	CLIV, 415	987
anomalum, Campostoma	XXXIX, 95	205
Anoplarchus atropurpureus	CCCXLIII, 835	2422
Anoplopoma fimbria	CCLXXIX, 674	1862
Anthias asperlinguis	CXCIII, 507	1227
antillarum, Talismania	LXXIV, 198	455
Antimora viola	CCCLXII, 893, 893*a*	2544
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Aphredoderus sayanus	CXXII, 331	786
Aplidonotus grunniens	CCXXVI, 574	1484
Apodichthys flavidus	CCCXLI, 830	2411
apodus, Neomænis	CXCVII, 515	1258
Apogon pigmentarius	CLXXVIII, 472	1109
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Apogonichthys alutus	CLXXVIII, 473	1110
Apomotis symmetricus	CLIX, 434	998
Aprion macrophthalmus	CCI, 523	1280
Aprodon cortezianus	CCCXLIX, 852	2461
Apsilus dentatus	CC, 522	1278
aræa, Atherina	CXXIII, 333	790
Archoplites interruptus	CLVII, 420	991
Archosargus probatocephalus	CCXVI, 554	1361

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Arctozenus coruscans	XCVI, 259	601
arcuatus, Pomacanthus	CCLI, 623	1679
ardens, Catostomus	XXXIV, 84	179
arenatus, Priacanthus	CXCV, 511	1237
argentatus, Gairdropsarus	CCCLXVII, 906	2559
argentea, Bathyclupea	CXXIX, 352	835
Steindachneria	CCCLXVIII, 909	2568
argenteus, Larimus	CCXXI, 565	1421
Argentina silus	LXXXVII, 232	526
Argyropelecus olfersi	XCVII, 261, 261*a*	604
argyrosomus, Damalichthys	CCXXXII, 586	1509
nigripinnis	LXXVI, 203	472
armatus, Leptocottus	CCCII, 732	2012
armiger, Alexurus	CCCXXV, 784	2203
Artediellus atlanticus	CCLXXXV, 689	1906
Ascelichthys rhodorus	CCCV, 739	2025
ascensionis, Holocentrus	CXXXI, 358	848
asper, Exerpes	CCCXXXVII, 818	2367
aspera, Limanda	CCCLXXVII, 930	2645
asperlinguis, Anthias	CXCIII, 507	1227
Aspidophoroides gunther	CCCXII, 755, 755*a*, 755*b*	2090
monopterygius	CCCXII, 756, 756*a*	2091
asprella, Crystallaria	CLXXI, 453	1061
asprellus, Radulinus	CCLXXXVII, 695	1920
aspro, Hadropterus	CLXVI, 438	1032
Asternopteryx gunnelliformis	CCCXLIII, 834	2420
Astrolytes notospilotus	CCLXXXIV, 688, 688*a*	1899
Astronesthes gemmifer	XCIII, 251	586
richardsoni	XCIV, 252	587
Astroscopus y-græcum	CCCXXXIV, 808	2307
atchafalayæ, Signalosa	LXIX, 184	2809
Atheresthes stomias	CCCLXXI, 917	2609
Atherina arræ	CXXIII, 333	790
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atherinoides, Chriodorus	CXVI, 310	719
Atherinops affinis	CXXVI, 342	807
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atlantica, Eblemmaria	CCCXL, 826	2402
atlanticus, Artediellus	CCLXXXV, 689	1906
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Rupiscartes	CCCXXXIX, 825	2397
Tarpon	LXVII, 177	409
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atrocaudalis, Notropis cayuga	XLVI, 114	260
atromaculatus, Semotilus	XL, 100	222
atropurpureus, Anoplarchus	CCCXLIII, 835	2422
Auchenopterus nox	CCCXXXVII, 819	2373
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auratus, Mullus	CXXXII, 360	856
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aureolus, Salvelinus alpinus	LXXXIII, 220	511
auritus, Lepomis	CLIX, 425, 425*a*	1001
aurofrenatum, Sparisoma	CCXLIII, 610	1634
aurolineatum, Bathystoma	CCVII, 535	1310
aurorubens, Rhomboplites	CC, 521	1277
austrinum, Moxostoma	XXXVII, 92	192
Auxis thazard	CXXXIII, 365	867
Averruncus emmelane	CCCIX, 749, 749*a*	2069
sterletus	CCCX, 750, 750*a*	2071
avocetta, Nemichthys	LX, 157	369
Avocettina gillii	LIX, 154, 154*a*, 154*b*	367, 2801
axillaris, Myoxocephalus	CCXCVII, 721	1980
axinophrys, Xystes	CCCX, 752, 752*a*	2076
aya, Neomænis	CXCVII, 516	1264
Azevia papamensis	CCCLXXXIV, 942	2677
aztecus, Notropis	XLV, 112	258
azurea, Hermosilla	CCXIX, 558	1383

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Azurina hirundo	CCXXXIII, 588	1544
bahianus, Teuthis	CCLVI, CCLVII, 629*a*	1693
Bairdiella chrysura	CCXXII, 566	1433
bairdii, Gastrostomus	LXVII, 176	406
Microspathodon	CCXXXV, 592	1566
bajonado, Calamus	CCXIII, 548	1352
Balistes carolinensis	CCLVIII, 631	1701
balteatus, Leuciscus	XLII, 105, 105*a*	238
Barathrodemus manatinus	CCCLVII, 880	2517
Barathronus bicolor	CCCLVIII, 883	2524
barbata, Brotula	CCCLIV, 871	2500
Pallasina	CCCVIII, 744	2049
barbatulum, Lemonema	CCCLXVI, 904	2556
barbatum, Lyconema	CCCLII, 863	2474
barracuda, Sphyræna	CXXVIII, 349	823, 2841
bartoni, Cichlasoma	CCXXXII, 587	1515
Bascanichthys peninsulæ	LXIII, 166, 166*a*	379
scuticaris	LXIII, 165	378
Bassogigas gillii	CCCLVII, 879	2515
Bassozetus catena	CCCLVI, 876, 876*a*	2509
normalis	CCCLVI, 875	2507
Bathyclupea argentea	CXXIX, 352	835
Bathygadus favosus	CCCLXVII, 908	2565
Bathygonus nigripinnis	CCCXI, 753	2078
Bathylagus benedicti	LXXXVIII, 234	529
Bathymaster signatus	CCCXXXII, 802	2288
Bathyphasma ovigerum	CCCXVIII, 767	2128
Bathypterois quadrifilis	LXXXIX, 238	544
Bathystoma aurolineatum	CCVII, 535	1310
rimator	CCVI, 534	1308
beanii, Ammocrypta	CLXXII, 455	1064
Limanda	CCCLXXVIII, 932	2646
Serrivomer	LVIII, 153	367
Triglops	CCLXXXVIII, 697	1924
bella, Hypoclydonia	CLXXIX, 475	1115
Bellator egretta	CCCXXI, 773	2174
benedicti, Bathylagus	LXXXVIII, 234	529
Benthodesmus atlanticus	CXXXVI, 374	887
Benthosaurus grallator	LXXXIX, 237	543
beryllina, Menidia gracilis	CXXIV, 338	797
beryllinus, Cryptotomus	CCXLII, 608	1625
Beryx splendens	CXXXI, 357	844
bicaudalis, Lactophrys	CCLXII, 639, 639*a*, 639*b*	1723
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bicolor, Barathronus	CCCLVIII, 883	2524
Leuciscus	XLI, 102	232
Rondeletia	XC, 240	548
Rutilus	XLIII, 107	244
bilineata, Lepidopsetta	CCCLXXVI, 928	2643
bilineatus, Anisotremus	CCVIII, 538	1319
Characodon	CIX, 293	668
bilobus, Histiocottus	CCCIII, 735	2018
birostris, Manta	XVIII, 39	92
bison, Enophrys	CCXCI, 705	1938
bistrispinus, Rypticus	CXCIV, 509	1233
bivittatus, Iridio	CCXXXIX, 601	1595
blackfordi, Yarrella	XCIII, 249	584
Blennicottus embryum	CCCIII, 734	2016, 2864
blennioides, Diplesion	CLXX, 449	1053
Blennius cristatus	CCCXXXVIII, 821	2382
favosus	CCCXXXVIII, 820	2380
Blepsias cirrhosus	CCCIV, 736, 736*a*, 736*b*	2018
Bodianus fulvus punctatus	CLXXXII, 481	1146
Boleichthys fusiformis	CLXXVII, 469	1101
boleoides, Radulinus	CCLXXXVII, 694	1919
Boleosoma camurum	CLXXI, 452	1060
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borealis, Icelinus	CCLXXXIV, 687	1896
Borogadus saida	CCCLIX, 885	2533
boulengeri, Mycteroperca	CLXXXVII, 490	1171
bouvieri, Salmo clarkii	LXXX, 212	496, 2819
brachiusculus, Grammicolepis	CLII, 410	974
Brachygenys chrysargyreus	CCVI, 533	1307
Brachyistius frenatus	CCXXIX, 580	1499
brachyptera, Remora	CCCXXX, 797; 797*a*	2272
Branchiostoma caribæum	I, 1	3
brasiliensis, Hemirhamphus	CXVII, 313	722
Narcine	XIII, 35, 35*a*	78
Scorpæna	CCLXXVII, 669	1842
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brevirostrum, Acipenser	XXI, 47	106
brevispinis, Sebastodes	CCLXXI, 657	1787
Brevoortia tyrannus	LXXIII, 195	434
Brotula barbata	CCCLIV, 871	2500
brunneus, Ilyophis	LVI, 145	350
Brycon dentex	LV, 141	337
Bryostema nugator	CCCXLI, 829	2410
polyacanthocephalum	CCCXLI, 828	2408
buccata, Ericymba	LI, 129	302
bulleri, Prionodes	CXCI, 503	1213
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bajonado	CCXIII, 548	1352
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calamus, Calamus	CCXII, 546	1349
Calechelys muræna	LXIII, 164	378
californica, Tetronarce	XII, 34, 34*a*	77
californiensis, Atherinopsis	CXXV, 341	806
Medialuna	CCXX, 560	1391
Typhlogobius	CCCXXIX, 795	2262
callarias, Gadus	CCCLXI, 891	2541
Callionymus agassizii	CCCXXIII, 779	2186
calliurus, Ioglossus	CCCXXIII, 780	2193
callyodon, Neoliparis	CCCXIV, 760, 760*a*	2110
Calotomus xenodon	CCXLIII, 609, 609*a*	1626
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Campostoma anomalum	XXXIX, 95	205
camurum, Boleosoma	CLXXI, 452	1060
Etheostoma	CLXXII, 456	1076
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canadus, Rachycentron	CXLVIII, 401	948
canaliculatus, Icelus	CCLXXXVI, 693	1917
Cantherines caroli	CCLVIII, 632	1713
capistratus, Chætodon	CCL, 622	1677
caprinus, Otrynter	CCXI, 543	1345
caprodes, Percina	CLXV, 436, 436*a*	1026
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hippos	CXLI, 387	920
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carapinus, Coryphænoides	CCCLXVIII, 911	2579
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caribbæus, Colorhynchus	CCCLXX, 915	2589
carinatus, Labychthys	LIX, 155	368
carminalis, Enneanectes	CCCXXXVI, 814	2350
carminatus, Colorhynchus	CCCLXIX, 914	2588
carolæ, Cantherines	CCLVIII, 632	1713
carolinensis, Balistes	CCLVIII, 631	1701
carolinus, Prionotus	CCCXVIII, 768	2156
Trachinotus	CXLVII, 398	944
carpio, Cyprinodon	CXII, 297	675
Carpiodes cyprinus	XXX, 71	167
caryi, Hypsurus	CCXXXI, 585	1508
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latipinnis	XXXI, 74	174
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catostomus, Catostomus	XXXII, 77	176
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caudatus, Lepidopus	CXXXVI, 373	886
caudilimbatus, Leptocephalus	LVII, 149	355
Caularchus mæandricus	CCCXXXV, 812	2328
Caulolatilus microps	CCCXXX, 799	2277
Caulophryne jordani	CCCXCI, 957	2735
caurinus, Mylocheilus	XL, 99	219
Sebastodes	CCLXXIV, 663	1820
cavernosus, Hymenocephalus	CCCLXIX, 912	2580
cayorum, Corythroichthys	CXX, 326	2838
Ogilbia	CCCLV, 873	2503
cayuga atrocaudalis, Notropis	XLVI, 114	260
Centrarchus macropterus	CLV, 417	988
Centrocymnus cœlolepis	VIII, 25	55
Centrolophus niger	CXLIX, 403	963
Centropomus undecimalis	CLXXIX, 476	1118
Centropristes philadelphicus	CXCI, 501	1201
striatus	CXC, 500	1199
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cepedianum, Dorosoma	LXIX, 183	416
Cephalacanthus volitans	CCCXXIII, 778	2183
cephalus, Mugil	CXXVI, 343	811
Ceratias holbolli	CCCLXXXIX, 954	2729
Ceratocottus diceraus	CCXCI, 706	1940
Ceratoscopelus maderiensis	XC, 242	557
cerdale, Scytalina	CCCXLVIII, 849, 849*a*, 849*b*	2454
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Chænomugil proboscideus	CXXVII, 346	816
Chætodipterus faber	CCXLVII, 619	1668
Chætodon capistratus	CCL, 622	1677
nigrirostris	CCXLVIII, 620	1673
ocellatus	CCXLIX, 621	1674
chætodon, Mesogonistius	CLVIII, 423	995
chalcogramma, Theragra	CCCLX, 887	2535
Chalinura simula	CCCLXVIII, 910	2578
Channomuræna vittata	LXVI, 174	404
Chanos chanos	LXIX, 182	414
chanos, Chanos	LXIX, 182	414
Characodon bilineatus	CIX, 293	668
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Chasmistes copei	XXXV, 87	2795
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Chasmodes saburræ	CCCXXXIX, 824	2392
Chauliodus sloanei	XCIII, 250	585
Chaunax pictus	CCCLXXXIX, 953	2726
Cheilodipterus affinis	CLXXIX, 474	1113
cheneyi, Cottogaster	CLXIX, 445	2851
chesteri, Urophycis	CCCLXVI, 903	2556
Chiasmodon niger	CCCXXXII, 804	2291
chihuahua, Notropis	XLVI, 116	265
Chilomycterus schœpfi	CCLXVI, 648	1748
Chimæra affinis	XIX, 40	95
Chirostoma humboldtianum	CXXIII, 334	793
chirus, Xiphistes	CCCXLIV, 837	2424
Chitonotus pugetensis	CCLXXXIII, 686	1890
chlamydes, Bollmannia	CCCXXVIII, 791	2238
Chlorichthys grammaticus	CCXLI, 604	1610
chloropterus, Alphestes	CLXXXVI, 488, 488*a*	1164

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Chologaster cornutus	CXV, 305	703
Chriodorus atherinoides	CXVI, 310	719
chromis, Pogonias	CCXXV, 573	1482
chrysargyreus, Brachygenys	CCVI, 533	1307
chrysochloris, Pomolobus	LXX, 187	425
chrysops, Roccus	CLXXX, 477	1132
Stenotomus	CCXI, 544	1346
chrysopterus, Orthopristis	CCX, 541	1338
chrysotus, Fundulus	CVII, 287	655
chrysura, Bairdiella	CCXXII, 566	1433
chrysurus, Cloroscombrus	CXLV, 394	938
Microspathodon	CCXXXV, 593	1567
Ocyurus	CXCIX, 520	1275
chrysypa, Anguilla	LV, 143	348
chuss, Urophycis	CCCLXV, 902	2555
Cichlasoma bartoni	CCXXXII, 587	1515
ciliaris, Angelichthys	CCLIV, 626, 626*a*	1684
ciliatus, Monacanthus	CCLIX, 633	1714
Sebastodes	CCLXX, 655	1783
cimbrius, Enchelyopus	CCCLXVII, 907	2560
cinereum, Etheostoma	CLXXIII, 457	1078
Xystema	CCXVIII, 556	1372
cirratum, Ginglymostoma	IV, 13	26
cirratus, Urophycis	CCCLXIV, 899	2553
Cirrhites rivulatus	CCXXVII, 576	1491
cirrhosus, Blepsias	CCCIV, 736, 736*a*, 736*b*	2018
Citharichthys macrops	CCCLXXXV, 944	2684
sordidus	CCCLXXXIV, 943	2679
clara, Ammocrypta pellucida	CLXXII, 454	1063
clarkii bouvieri, Salmo	LXXX, 212	496; 2819
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Clevelandia ios	CCCXXVIII, 793	2254
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Cœlorhynchus caribbæus	CCCLXX, 915	2589
carminatus	CCCLXIX, 914	2588
occa	CCCLXIX, 913	2588
colias, Scomber	CXXXIII, 364	866
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Columbia transmontanus	CXXII, 330	784
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Chasmistes	XXXV, 87	2795
Copelandellus quiescens	CLXXVI, 468	1100
corallinum, Cryptotrema	CCCXXXVII, 817	2366
coregonoides, Paralepis	XCVI, 260	602
Coregonus clupeiformis	LXXVI, 202	465
coulterii	LXXVI, 201	462
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cornubica, Lamna	VI, 22	49
cornutus, Chologaster	CXV, 305	703
Zanclus	CCLV, 627	1687
cortezianus, Aprodon	CCCXLIX, 852	2461

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Coryphæna hippurus	CXLIX, 402	952
Coryphænoides carapinus	CCCLXVIII, 911	2579
Corythroichthys cayorum	CXX, 326	2838
Cottogaster cheneyi	CLXIX, 445	2851
shumardi	CLXVIII, 444	1046
Cottus aleuticus	CCXCIII, 711	1957
evermanni	CCXCII, 707	1945
klamathensis	CCXCIII, 710	1955
liopomus	CCXCIV, 712	1962
perplexus	CCXCIII, 709	1955
princeps	CCXCIV, 713	1962
punctulatus	CCXCII, 708	1948
couesii, Cryptopsaras	CCCXC, 956	2731
coulterii, Coregonus	LXXVI, 201	462
crassiceps, Plectromus	CXXX, 356	843
crestonis, Teuthis	CCLVI, 628	1692
cretense, Sparisoma	CCXLV, 616*a*	------
cristatus, Blennius	CCCXXXVIII, 821	2382
Cristivomer namaycush	LXXXII, 217	504
cristulata, Scorpæna	CCLXXVI, 668	1841
crocodilus, Lampanyctus	XCI, 243	558
crossotus, Etropus	CCCLXXXVI, 946	2689
crotalinus, Embryx	CCCXLVIII, 851	2458
cruentifer, Pisoodonophis	LXII, 163	377
crumenophthalmus, Trachurops	CXLI, 385	911
Cryptacanthodes maculatus	CCCXLV, 843	2443
Cryptopsaras couesii	CCCXC, 956	2731
Cryptotomus beryllinus	CCXLII, 608	1625
Cryptotrema corallinum	CCCXXXVII, 817	2366
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crysos, Caranx	CXLII, 388	923
Crystallaria asprella	CLXXI, 453	1061
culveri, Trachinotus	CXLVII, 397	942
curema, Mugil	CXXVI, 344	813
cuvieri, Tetragonurus	CLII, 411	976
cuzamilæ, Scarus	CCXLIV, 612	1648
Cycleptus elongatus	XXX, 72	168
Cyclopterus lumpus	CCCXIII, 757	2096
cyclopus, Liparis	CCCXVI, 764, 764*a*	2118
Cymatogaster aggregatus	CCXXVIII, 579, 579*a*	1498
Cynoscion nebulosus	CCXXI, 563	1409
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Cyprinodon carpio	CXII, 297	675
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cyprinus, Carpiodes	XXX, 71	168
Cypsilurus californicus	CXIX, 319	740, 2830
Dallia pectoralis	XCIX, 267	621
Damalichthys argyrosomus	CCXXXII, 586	1509
Dasyatis sabina	XIV, 36, 36*a*	84
Dasycottus setiger	CCC, 727	1991
decagrammus, Hexagrammos	CCLXXX, 676, 676*a*	1867
Decapterus macarellus	CXL, 383	909
decurrens, Pleuronichthys	CCCLXXV, 926	2637
dekayi, Isurus	VI, 21	48
dennyi, Liparis	CCCXVII, 766, 766*a*	2124
dentatus, Apsilus	CC, 522	1278
Grammatostomias	XCIV, 254	590
Paralichthys	CCCLXXIII, 922	2629
dentex, Brycon	LV, 141	337
Osmerus	LXXXVI, 229	524
Derichthys serpentinus	LV, 142	343
dermatinus, Lycodapus	CCCLIV, 870	2492
Dermatolepis zanclus	CLXXXVI, 489	2854
diaphanus, Fundulus	CIII, 275, 275*a*	645
diapterus, Furcimanus	CCCLI, 861	2472
diceraus, Ceratocottus	CCXCI, 706	1940
Dicrolene intronigra	CCCLVIII, 882	2522

Genera and species.	Plate and figure.	Text page.
Dicromita agassizii	CCCLV, 874	2506
Diodon hystrix	CCLXVI, 647	1745
Diplectrum formosum	CXCI, 502	1207
Diplesion blennioides	CLXX, 449	1053
Diplodus holbrookii	CCXVII, 555, 555*a*	1362
dispilus, Iridio	CCXL, 602	1597
dodecaedron, Occa	CCCVIII, 743	2044
dolichogaster, Pholis	CCCXLII, 831	2416
dolomieu, Micropterus	CLXII, 430, 430*a*	1011
Dormitator maculatus	CCCXXIV, 782	2196
dormitor, Philypnus	CCCXXIV, 781	2194
Dorosoma cepedianum	LXIX, 183	416
dorsalis, Microspathodon	CCXXXVI, 594	1568
Seriola	CXXXIX, 380	902
dovii, Anableps	CXIII, 300	685
drummond-hayi, Epinephelus	CLXXXIII, 484	1159
ductor, Naucrates	CXXXIX, 379	900
dugesii, Adinia	CVIII, 290	661
Algansea	XL, 98	211
Ameiurus	XXVI, 59, 59*a*, 59*b*	138
dulcis, Rhinichthys	LII, 132	306
duquesnii, Placopharynx	XXXIII, 82	198
earlli, Urophycis	CCCLXV, 900	2554
Echeneis naucrates	CCCXXIX, 796	2269
egmontis, Ahlia	LX, 158	370
egretta, Bellator	CCCXXI, 773	2174
eigenmanni, Evarra	LI, 131	304
Sebastodes	CCLXXI, 658	1789
Elanura forficata	CCLXXXIX, 701	1930
elassodon, Hippoglossoides	CCCLXXII, 920	2615
Elassoma evergladei	CLIII, 414	982
elegans evides, Gibbonsia	CCCXXXVI, 815	2352
Eleginus navaga	CCCLX, 888	2537
Eleotris pisonis	CCCXXV, 783	2200
elongatus, Cycleptus	XXX, 72	168
Labichthys	LIX, 156	369
Ophidion	CCLXXXII, 681	1875
Elops saurus	LXVII, 178	410
Emblemaria atlantica	CCCXL, 826	2402
emblematicus, Scarus	CCXLV, 614	1654
embryum, Blennicottus	CCCIII, 734	2016, 2864
Embryx crotalinus	CCCXLVIII, 851	2458
emiliæ, Opsopœodus	XLIV, 109	248
Emmeekia venusta	CCXL, 603	1602
emmelane, Averruncus	CCCIX, 749, 749*a*	2069
Empetrichthys merriami	CX, 294–294*d*	667
Enchelyopus cimbrius	CCCLXVII, 907	2560
Enneacanthus gloriosus	CLVIII, 422	993
Enneanectes carminalis	CCCXXXVI, 814	2350
Enophrys bison	CCXCI, 705	1938
Entosphenus tridentatus	I, 4	12
Epinephelus adscensionis	CLXXXII, 482	1152
drummond-hayi	CLXXXIII, 484	1159
morio	CLXXXIV, 485	1160
striatus	CLXXXIII, 483	1157
Epinnula magistralis	CXXXV, 371	880
Eques lanceolatus	CCXXVI, 575	1489
eriarcha, Eurystole	CXXV, 339	803
Ericymba buccata	LI, 129	302
Erimyzon sucetta	XXXVI, 89	185
erinacea, Raja	IX, 29	68
Erotelis smaragdus	CCCXXV, 785	2204
Escolar violaceus	CXXXV, 370	878, 2843
Eslopsarum jordani	CXXIII, 335	793, 2840
Etelis oculatus	CCI, 524	1282
etheostoma, Aboma	CCCXXVIII, 792	2240
Etheostoma camurum	CLXXII, 456	1076
cinereum	CLXXIII, 457	1078
iowæ	CLXXIV, 460	1083
jessiæ	CLXXIV, 461	1084

Genera and species.	Plate and figure.	Text page.
Etheostoma jordani	CLXXIII, 458	1079
juliæ	CLXXVI, 466	1093
lepidogenys	CLXXIV, 462	1087
obeyense	CLXXV, 463	1092
pagei	CLXXV, 464	1092
pottsii	CLXXIII, 459	1082
virgatum	CLXXV, 465	1093
Etropus crossotus	CCCLXXXVI, 946	2689
rimosus	CCCLXXXV, 945	2688
Eupomacentrus rectifrenum	CCXXXIII, 589	1557, 3176
Eupomotis euryorus	CLXI, 428	1008
gibbosus	CLXI, 429	1009
euryorus, Eupomotis	CLXI, 428	1008
Eurystole eriarcha	CXXV, 339	803
Evarra eigenmanni	LI, 131	304
evergladei, Elassoma	CLIII, 414	982
evermanni, Cottus	CCXCII, 707	1945
Thyrina	CXXV, 340	804
Evermannia zosterura	CCCXXIX, 794	2256
evides, Gibbonsia elegans	CCCXXXVI, 814	2352
Hadropterus	CLXVII, 440	1036
eviosthas, Quassiremus	LXIV, 167	380
evolans, Prionotus	CCCXX, 772	2168
Evoplites viridis	CXCVI, 514	1246
Evoxymetopon tæniatus	CXXXVI, 372	886
Exerpes asper	CCCXXXVII, 818	2367
exilis, Schilbeodes	XXVIII, 65	147
Exocœtus volitans	CXVIII, 318	734
Exoglossum maxillingua	LIV, 140	327
Exonautes exsiliens	CXVIII, 316	732, 2830
rondeletii	CXVIII, 317	733, 2830
exsiliens, Exonautes	CXVIII, 316	732, 2830
faber, Chætodipterus	CCXLVII, 619	1668
fabricii, Centroscyllium	VIII, 26	56
falcata, Agosia	LIII, 135	313
phenax, Mycteroperca	CLXXXVIII, 495	1185
falcatus, Trachinotus	CXLVI, 396	941
fasciatus, Achirus	CCCLXXXVII, 948	2700
favosus, Bathygadus	CCCLXVII, 908	2565
Blennius	CCCXXXVIII, 820	2380
Felichthys felis	XXIII, 52	118
felis, Felichthys	XXIII, 52	118
ferox, Alepisaurus	XCV, 257	595
Stomias	XCIV, 253	588
ferruginea, Limanda	CCCLXXVII, 929	2644
fimbria, Anoplopoma	CCLXXIX, 674	1862
Flammeo marianus	CXXXI, 359	852, 2871
flavescens, Perca	CLXV, 435	1023
flavidus, Apodichthys	CCCXLI, 830	2411
Aulorhynchus	CXX, 323	754
Congrellus	LVIII, 150	357
flavus, Noturus	XXVII, 63	144
floræ, Neoliparis	CCCXV, 762	2111
floridæ, Jordanella	CXII, 298	677
Fodiator acutus	CXVII, 315	728
fœtens, Synodus	LXXXVIII, 236	538
fonticola, Microperca	CLXXVII, 470	1104
fontinalis, Salvelinus	LXXXII, 218	506
forficata, Elanura	CCLXXXIX, 701	1930
formosa, Heterandria	CXIV, 302	687
formosum, Diplectrum	CXCI, 502	1207
francisci, Gyropleurodus	III, 9	20
frenatus, Brachyistius	CCXXIX, 580	1499
Sarritor	CCCX, 751	2073
frigidus, Lycodes	CCCL, 856	2465
fulvus, Physiculus	CCCLXIII, 896	2547
punctatus, Bodianus	CLXXXII, 481	1146
funduloides, Fundulus	CVI, 282	650
Fundulus albolineatus	CV, 281	649

Genera and species.	Plate and figure.	Text page.
Fundulus catenatus	CIV, 278, 278*a*	648
chrysotus	CVII, 287	655
diaphanus	CIII, 275, 275*a*	645
funduloides	CVI, 282	650
goodei	CIX, 291	664, 2831
heteroclitus	CII, 273	640
jenkinsi	CVI, 284	651
luciæ	CVII, 286	654
macdonaldi	CVI, 283	651
majalis	CI, 271, 271*a*, 271*b*	639
notatus	CVIII, 289	659
nottii	CVIII, 288	656
ocellaris	CII, 274	642
pallidus	CII, 272	638
pulvereus	CVII, 285	652
rathbuni	CV, 280	649
seminolis	CIV, 277	647
stellifer	CV, 279	648
zebrinus	CIII, 276	646
furcatus, Ictalurus	XXV, 56	134
Phanerodon	CCXXX, 583	1506
furcifer, Paranthias	CXCII, 504	1221
Furcimanus diapterus	CCCLI, 861	2472
furiosus, Schilbeodes	XXIX, 69, 69*a*, 69*b*	149
fusiformis, Boleichthys	CLXXVII, 469	1101
Gadus callarias	CCCLXI, 891	2541
gairdneri, Salmo	LXXXI, 215	497
Gairdropsarus argentatus	CCCLXVII, 906	2559
galacturus, Notropis	XLVIII, 122	279
galeatus, Gymnocanthus	CCCI, 730	2010
Galeichthys azureus	XXIV, 55	2775
gilberti	XXIV, 54	2773
milberti	XXIII, 53	128
Galeorhinus zyopterus	IV, 15	32
Gambusia affinis	CXIII, 299, 299*a*	680
Garmannia paradoxa	CCCXXVII, 790	2232
Garrupa nigrita	CLXXXIV, 486	1161
Gasterosteus aculeatus	CXIX, 320	747
cataphractus	CXIX, 321	749
Gastrostomus bairdii	LXVII, 176	406
gemma, Hypoplectrus	CLXXXIX, 497	1193
gemmifer, Astronesthes	XCIII, 251	586
Germa alalunga	CXXXIV, 367	871
Gerres olisthostomus	CCXVIII, 557	1376
Gibbonsia elegans evides	CCCXXXVI, 815	2352
gibbosus, Eupomotis	CLXI, 429	1009
gilberti, Galeichthys	XXIV, 54	2773
Schilbeodes	XXVIII, 67, 67*a*, 67*b*	148
Sebastodes	CCLXXV, 665	1823
Ulocentra	CLXIX, 446	1049
Gilbertidia sigolutes	CCCVI, 741	2028
gilli, Avocettina	LIX, 154, 154*a*, 154*b*	367, 2801
Bassogigas	CCCLVII, 879	2515
Cetomimus	XC, 241	549
Lipogenys	XCIX, 266	619
Neobythites	CCCLVII, 877	2512
Ginglymostoma cirratum	IV, 13	26
glacialis, Liopsetta	CCCLXXX, 935	2649
glauca, Prionace	IV, V, 16, 16*a*	33
glaucus, Trachinotus	CXLVI, 395	940
glesne, Regalecus	CCCLXX, 916	2596
globosa, Lyosphæra	CCLXVII, 649, 649*a*	1751
gloriosus, Enneacanthus	CLVIII, 422	993
Gnathypops maxillosa	CCCXXXI, 801	2284
gobioides, Hypsicometes	CCCXXXIII, 805	2294
Gobius hastatus	CCCXXVI, 788	2229
oceanicus	CCCXXVII, 789, 789*a*	2230
stigmaticus	CCCXXVI, 787	2224
Goodea atripinnis	CXIV, 301	685
goodei, Fundulus	CIX, 291, 664	2831

Genera and species.	Plate and figure.	Text page.
goodei, Ptilichthys	CCCXLVII, 848	2452
gorbuscha, Oncorhynchus	LXXVII, 205	478
gracile, Peristedion	CCCXXII, 776	2179
gracilis, Aldrovandia	XCVIII, 263	610
beryllina, Menidia	CXXIV, 338	797
Photonectes	XCV, 255	591
Platygobio	LIV, 139	326
grallator, Benthosaurus	LXXXIX, 237	543
Gramma loreto	CXCIII, 508	1229
grammaticus, Chlorichthys	CCXLI, 604	1610
Grammatostomias dentatus	XCIV, 254	590
Grammicolepis brachiusculus	CLII, 410	974
grandicornis, Scorpæna	CCLXXVIII, 671	1850
greeni, Neoliparis	CCCXVI, 763, 763*a*	2112
griseus, Catostomus	XXXI, 75	175
Hexanchus	II, 8	19
grunniens, Aplidonotus	CCXXVI, 574	1484
guacamaia, Pseudoscarus	CCXLVI, 617	1657
gulosus, Chænobryttus	CLVII, 421	992
gunnelliformis, Asternopteryx	CCCXLIII, 834	2420
gunnellus, Pholis	CCCXLII, 832	2419
guntheri, Aspidophoroides	CCCXII, 755, 755*a*, 755*b*	2090
Hadropterus	CLXVII, 439	1033
Hoplopagrus	CXCVI, 513	1244
guttatus, Percopsis	CXXI, 329	784
guttifer, Ophichthus	LXIV, 168	383
Gymnelis viridis	CCCLII, 864–864*c*	2479
Gymnocanthus galeatus	CCCI, 730	2010
pistilliger	CCCI, 729, 729*a*, 729*b*	2006
Gymnosarda alleterata	CXXXIV, 366	862
Gyropleurodus francisci	III, 9	20
Hadropterus aspro	CLXVI, 438	1032
evides	CLXVII, 440	1036
guntheri	CLXVII, 439	1033
macrocephalus	CLXVI, 437	1031
scierus	CLXVII, 441	1037
Hæmulon album	CCIII, 528	1295
macrostomum	CCIV, 529	1296
parra	CCIV, 530	1297
plumieri	CCV, 532	1304
sciurus	CCV, 531	1303
harengus, Clupea	LXX, 185	421
Harriota raleighana	XIX, 42	96
hastatus, Gobius	CCCXXVI, 788	2229
helleri, Xiphophorus	CXV, 304	701
Hemianthias vivanus	CXCII, 505	1223
Hemicaranx amblyrhynchus	CXLI, 386	912
hemilepidotus, Hemilepidotus	CCXC, 704, 704*a*, 704*b*	1935
Hemilepidotus hemilepidotus	CCXC, 704, 704*a*, 704*b*	1935
jordani	CCXC, 703	1934
Hemirhamphus brasiliensis	CXVII, 313	722
Hemitripterus americanus	CCCV, 738	2023
hemphillii, Stathmonotus	CCCXL, 827	2407
henshawi, Salmo clarkii	LXXIX, 208	493, 2819
hentz, Hypsoblennius	CCCXXXIX, 823	2390
Hermosilla azurea	CCXIX, 558	1383
Heterandria formosa	CXIV, 302	687
heteroclitus, Fundulus	CII, 273	640
Heterodontus philippii	III, 10	.....
Hexagrammos decagrammus	CCLXXX, 676, 676*a*	1867
octogrammus	CCLXXX, 677	1869
otakii	CCLXXXI, 680	1867
stelleri	CCLXXXI, 678	1871
superciliosus	CCLXXXI, 679	1872
Hexanchus griseus	II, 8	19
Hiodon selenops	LXVIII, 181	414
tergisus	LXVIII, 180	413
Hippocampus hudsonius	CXXI, 327	777
zosteræ	CXXI, 328	778
Hippoglossoides elassodon	CCCLXXII, 920	2615
platessoides	CCCLXXII, 919	2614
Hippoglossus hippoglossus	CCCLXXI, 918	2611

Genera and species.	Plate and figure.	Text page.
hippoglossus, Hippoglossus	CCCLXXI, 918	2611
hippos, Caranx	CXLI, 387	920
hippurus, Coryphæna	CXLIX, 402	952
hirundo, Azurina	CCXXXIII, 588	1544
Leiocottus	CCCII, 731	2011
hispidus, Monacanthus	CCLIX, 634	1715
Histiobranchus infernalis	LVII, 147	352
Histiocottus bilobus	CCCIII, 735	2018
Holacanthus tricolor	CCLIII, 625	1684
holbolli, Ceratias	CCCLXXXIX, 954	2729
holbrookii, Diplodus	CCXVII, 555, 555*a*	1362
Holocentrus ascensionis	CXXXI, 358	848
hopkinsi, Hynnis	CXLIII, 391	933
Sebastodes	CCLXXII, 659	1789
hoplomystax, Sparisoma	CCXLIV, 611	1632
Hoplopagrus guntheri	CXCVI, 513	1244
Hoplostethus mediterraneus	CXXX, 354	837
Hoplunnis schmidtii	LVIII, 151	361
hospes, Mugil	CXXVII, 345	814
hudsonius, Hippocampus	CXXI, 327	777
Notropis	XLVII, 119	269
saludanus, Notropis	XLVIII, 120	270
humboldtianum, Chirostoma	CXXIII, 334	793
humeralis, Paralabrax	CXC, 499	1196
Sardinella *	LXXIII, 193	431
Hybopsis æstivalis marconis	LIII, 136	316
altus	LIV, 138	321
wataugа	LIII, 137	319
Hydrolagus colliei	XIX, 41	95
hydrophlox, Leuciscus	XLII, 104	238
Hymenocephalus cavernosus	CCCLXIX, 912	2580
Hynnis hopkinsi	CXLIII, 391	933
Hypoclydonia bella	CLXXIX, 475	1115
Hypocritichthys analis	CCXXX, 582	1500
Hypohomus aurantiacus	CLXVIII, 443	1043
spilotus	CLXVIII, 442	1040
Hypomesus olidus	LXXXVII, 231	525
pretiosus	LXXXVI, 230	525
Hypoplectrus gemma	CLXXXIX, 497	1193
unicolor nigricans	CLXXXIX, 496	1193
Hypoprion brevirostris	V, 18	41
Hyporhamphus roberti	CXVII, 312	721
unifasciatus	CXVI, 311	720
Hypsicometes gobioides	CCCXXXIII, 805	2294
Hypsoblennius hentz	CCCXXXIX, 823	2390
ionthas	CCCXXXVIII, 822	2388
Hypsurus caryi	CCXXXI, 585	1508
Hypsypops rubicundus	CCXXXIV, 591	1564
Hysterocarpus traski	CCXXVII, 577	1496
hystrix, Diodon	CCLXVI, 647	1745
Icelinus borealis	CCLXXXIV, 687	1896
Icelus canaliculatus	CCLXXXVI, 693	1917
spiniger	CCLXXXVI, 892	1914
Icichthys lockingtoni	CLI, 406	969
Ictalurus anguilla	XXV, 57	2788
furcatus	XXV, 56	134
punctatus	XXV, 58	134
Ictiobus cyprinella	XXX, 70	163
Ilyophis brunneus	LVI, 145	350
inermis, Rabirubia	CXCIX, 519	1274
infernalis, Histiobranchus	LVII, 147	352
infirmus, Novaculichthys	CCXLI, 606	1616
Inopsetta ischyra	CCCLXXVI, 927	2641
inornatus, Microlepidotus	CCX, 542	1341
insignis, Schilbeodes	XXVIII, 66	147
interruptus, Archoplites	CLVII, 420	991
intertinctus, Mystriophis	LXV, 170	386
intronigra, Dicrolene	CCCLVIII, 882	2522
Ioglossus calliurus	CCCXXIII, 780	2193
ionthas, Hypsoblennius	CCCXXXVIII, 822	2388
ios, Clevelandia	CCCXXVIII, 793	2254

* Plate by error labeled *Sardinella sardina*.

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iowæ, Etheostoma	CLXXIV, 460	1083
Ipnops murrayi	LXXXIX, 239	546
irideus, Salmo	LXXXI, 216	500
Iridio bivittatus	CCXXXIX, 601	1595
dispilus	CCXL, 602	1597
radiatus	CCXXXIX, 600	1590
ischyra, Inopsetta	CCCLXXVI, 927	2641
Istiophorus nigricans	CXXXVII, 376	891
Isurus dekayi	VI, 21	48
itaiara, Promicrops	CLXXXV, 487, 487*a*, 487*b*	1162
jaok, Myoxocephalus	CCXCVI, 719	1977
japonicus, Arctoscopus	CCCXXXIII, 807	2297
jenkinsi, Fundulus	CVI, 284	651
jessiæ, Etheostoma	CLXXIV, 461	1084
Xenocys	CCII, 526	1285
Jordanella floridæ	CXII, 298	677
jordani, Caulophryne	CCCXCI, 957	2735
Eslopsarum	CXXIII, 335	793, 2840
Etheostoma	CLXXIII, 458	1079
Hemilepidotus	CCXC, 703	1934
Mycteroperca	CLXXXVIII, 493	1176
Pantosteus	XXXI, 73	171
Ronquilus	CCCXXXII, 803	2289
Jordania zonope	CCLXXXII, 683	1884
Joturus pichardi	CXXVIII, 348	821
juliæ, Etheostoma	CLXXVI, 466	1093
kanawha, Notropis	XLVI, 115	264
Kathetostoma albigutta	CCCXXXIV, 809, 809*a*	2312
kendalli, Verma	LX, 159, 159*a*	375
Kirtlandia vagrans	CXXIV, 336	794
klamathensis, Agosia	LII, 133	3144
Cottus	CCXCIII, 710	1955
Kuhlia rupestris	CLXIII, 432	432
Kyphosus sectatrix	CCXIX, 559	1387
Labichthys carinatus	LIX, 155	368
elongatus	LIX, 156	369
lacera, Lagochila	XXXVIII, 94, 94*a*	199
Lachnolaimus maximus	CCXXXVII, 597	1579
Lactophrys bicaudalis	CCLXII, 639, 639*a*, 639*b*	1723
tricornis	CCLXI, 638	1724
trigonus	CCLXIII, 640, 640*a*	1723
triqueter	CCLXI, 637	1722
lævigatus, Lactophrys	CCLXIII, 641	1728
Lagocephalus lævigatus	CCLXIII, 641	1728
Lagochila lacera	XXXVIII, 94, 94*a*	199
Lagodon rhomboides	CCXV, 552	1358
lalandi, Seriola	CXL, 382	903
lamia, Carcharhinus	V, 17	38
Lamna cornubica	VI, 22	49
Lampadena speculigera	XCI, 244	561
Lampanyctus crocodilus	XCI, 243	558
Lampetra aurea	II, 5	13
spadicea	II, 6	13
lampetræformis, Lumpenus	CCCXLIV, 840	2438
lanceolatus, Eques	CCXXVI, 575	1489
Larimus argenteus	CCXXI, 565	1421
laticeps, Megalocottus	CCXCIX, 725, 725*a*	1988
latifrons, Anarhichas	CCCXLVI, 845	2446
latipinnis, Catostomus	XXXI, 74	174
latus, Caranx	CXLII, 389	921
Leiocottus hirundo	CCCII, 731	2011
leiopomus, Cottus	CCXCIV, 712	1962
Leiostomus xanthurus	CCXXIII, 569	1458
Lemonema barbatulum	CCCLXVI, 904	2556
melanurum	CCCLXVI, 905	2557
lentiginosus, Rhinobatus	VIII, 28; IX, 28*a*, 28*b*	62
lepidogenys, Etheostoma	CLXXIV, 462	1087
Lepidopsetta bilineata	CCCLXXVI, 928	2643
Lepidopus caudatus	CXXXVI, 373	886
Lepisosteus platostomus	XXII, 49	110
tristœchus	XXII, 50	111
Lepomis auritus	CLIX, 425, 425*a*	1001

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Lepomis megalotis	CLX, 426	1002
pallidus	CLX, 427	1005
Lepophidium marmoratum	CCCLIII, 866	2482
profundorum	CCCLIII, 867	2484
Leptocephalus caudilimbatus	LVII, 149	355
conger	LVII, 148	354
Leptocottus armatus	CCCII, 732	2012
Leptops olivaris	XXVII, 62	143
lepturus, Anarhichas	CCCXLVII, 847	2447
Trichiurus	CXXXVII, 375	889
Letharchus velifer	LXI, 160	375
Lethotremus muticus	CCCXIII, 758	2101
vinolentus	CCCXIV, 759	2101
Leuciscus balteatus	XLII, 105, 105*a*	238
bicolor	XLI, 102	232
hydrophlox	XLII, 104	238
lineatus	XLI, 103	232
siuslawi	XLIII, 106	2797
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Lobotes surinamensis	CXCIV, 510	1235
lockingtoni, Icichthys	CLI, 406	969
longispathum, Peristedion	CCCXXI, 775	2178
Lophius piscatorius	CCCLXXXVIII, 952	2713
Lophogobius cyprinoides	CCCXXVI, 786	2209
Lophopsetta maculata	CCCLXXXII, 938	2660
loreto, Gramma	CXCIII, 508	1229
Lota maculosa	CCCLXIV, 897	2550
Lotella maxillaris	CCCLXIII, 895	2546
Lucania parva	CIX, 292	665
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lucida, Æthoprora	XCII, 246	565
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Lumpenus lampetræformis	CCCXLIV, 840	2438
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lupus, Anarhichas	CCCXLVII, 846	2446
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Lycodonus mirabilis	CCCLII. 862	2474
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Lyconema barbatum	CCCLII, 863	2474
Lyosphæra globosa	CCLXVII, 649, 649*a*	1751
Lythrulon opalescens	CCVII, 536	1312
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macdonaldi, Fundulus	CVI, 283	651
Nannobrachium	XCI, 245	563
Notropis	XLIX, 123	284
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macellus, Prionistius	CCLXXXIX, 700	1928

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macrochir, Aldrovandia	XCVIII, 262	609
macrognathum, Opisthognathus	CCCXXXI, 800, 800*a*	2281
macrolepis, Pontinus	CCLXXVIII, 672	1855
macrophthalmus, Aprion	CCI, 523	1280
macrops, Citharichthys	CCCLXXXV, 944	2684
macropterus, Centrarchus	CLV, 417	988
macrostomum, Hæmulon	CCIV, 529	1296
maculata, Lophopsetta	CCCLXXXII, 938	2660
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maculatus, Aulostomus	CXX, 324	754
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Dormitator	CCCXXIV, 782	2196
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Scomberomorus	CXXXIV, 368	874
Spheroides	CCLXIV, 644	1733
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magistralis, Epinnula	CXXXV, 371	880
majalis, Fundulus	CI, 271. 271*a*. 271*b*	639
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malardi, Uraleptus	CCCLXII, 894	2545
maliger, Sebastodes	CCLXXIV, 664	1822
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manatinus, Barathrodemus	CCCLVII. 880	2517
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maxillosa, Gnathypops	CCCXXXI, 861	2284
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Lachnolaimus	CCXXXVII, 597	1579
meadiæ, Ulocentra	CLXIX, 447	2852
meanyi, Ruscarius	CCLXXXV, 690	1908
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medusophagus, Schedophilus	CLI, 407	970
Megalocottus laticeps	CCXCIX, 725, 725*a*	1988
platycephalus	CCXCIX, 724, 724*a*	1987
megalotis, Lepomis	CLX, 426	1002
Melanogrammus æglefinus	CCCLXI, 892, 892*a*	2542
melanops, Minytrema	XXXVI, 90	187
Sebastodes	CCLXIX, 654	1782
melanostictus, Psettichthys	CCCLXXIII, 921	2618
Melanostigma pammelas	CCCLII, 865	2479
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melas, Ameiurus	XXVI, 60	141
Melletes papilio	CCLXXXIX, 702	1932
Menidia gracilis beryllina	CXXIV, 338	797
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Menticirrhus americanus	CCXXV, 572	1474
Merluccius productus	CCCLIX, 884	2531
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Microlepidotus inornatus	CCX, 542	1341
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microlepis, Mycteroperca	CLXXXVIII, 494	1177
Microperca fonticola	CLXXVII, 470	1104
Micropogon undulatus	CCXXIV, 570	1461
microps, Caulolatilus	CCCXXX, 799	2277
Micropterus dolomieu	CLXII, 430, 430*a*	1011
salmoides	CLXIII, 431	1012
Microspathodon bairdii	CCXXXV, 592	1566
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dorsalis	CCXXXVI, 594	1568
milberti, Galeichthys	XXIII, 53	128
miles, Porogadus	CCCLVIII, 881	2520
miniatum, Peristedion	CCCXXI, 774	2178
miniatus, Sebastodes	CCLXXIII, 662	1794
minima, Abeona	CCXXVIII, 578	1497
Minytrema melanops	XXXVI, 90	187
mirabilis, Lycodonus	CCCLII, 862	2474
miurus, Schilbeodes	XXIX, 68	148
Mola mola	CCLXVII, 650	1753
mola, Mola	CCLXVII, 650	1753
Monacanthus ciliatus	CCLIX, 633	1714
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monopterygius, Aspidophoroides	CCCXII, 756, 756*a*	2091
Pleurogrammus	CCLXXIX, 675	1864
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multifasciatus, Pronotogrammus	CXCII, 506	1226
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Myctophum opalinum	XCII, 247	571
Mylocheilus caurinus	XL, 99	219
myops, Trachinocephalus	LXXXVIII, 235	533
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axillaris	CCXCVII, 721	1980
jaok	CCXCVI, 719	1977
niger	CCXCVIII, 723	1985
octodecimspinosus	CCXCVI, 717	1976
polyacanthocephalus	CCXCVI, 718	1976
scorpius	CCXCV, 716	1974
stelleri	CCXCVIII, 722, 722*a*, 722*b*	1981
verrucosus	CCXCVII, 720, 720a	1979

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tigrinus	LXI, 161	276
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mystinus, Sebastodes	CCLXX, 656	1784
Mystriophis intertinctus	LXV, 170	386
namaycush, Cristivomer	LXXXII, 217	504
Nannobrachium macdonaldi	XCI, 245	563
Narcine brasiliensis	XIII, 35, 35*a*	78
narinari, Ætobatus	XV, XVI, 37, 37*a*	88
Naucrates ductor	CXXXIX, 379	900
naucrates, Echeneis	CCCXXIX, 796	2269
navaga, Eleginus	CCCLX, 888	2537
nebulosus, Cynoscion	CCXXI, 563	1409
Nematistius pectoralis	CXXXVIII, 377	895
Nemichthys avocetta	LX, 157, 157*a*, 157*b*	369
Neobythites gillii	CCCLVII, 877	2512
marginatus	CCCLVII, 878	2513
Neoclinus satiricus	CCCXXXVI, 816	2355
Neoliparis callyodon	CCCXIV, 760, 760*a*	2110
floræ	CCCXV, 762	2111
greeni	CCCXVI, 763, 763*a*	2112
mucosus	CCCXV, 761, 761*a*	2111
Neomænis analis	CXCVIII, 517	1265
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nerka, Oncorhynchus	LXXVIII, 207, 207*a*, 207*b*	471
niger, Centrolophus	CXLIX, 403	963
Chiasmodon	CCCXXXII, 804	2291
Malacosteus	XCV, 256	593
Myoxocephalus	CCXCVIII, 723	1985
nigricans, Hypoplectrus unicolor	CLXXXIX, 496	1193
Istiophorus	CXXXVII, 376	891
nigripinnis, Argyrosomus	LXXVI, 203	472
Bathygonus	CCCXI, 753	2078
nigrirostris, Chætodon	CCXLVIII, 620	1673
nigrita, Garrupa	CLXXXIV, 486	1161
nigrocinctus, Sebastodes	CCLXXVI, 667	1827
nigrum, Boleosoma	CLXX, 450	1056
olmstedi, Boleosoma	CLXXI, 451	1057
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nothus, Cynoscion	CCXX, 561	1406
Notorhynchus maculatus	II, 7	17
notospilotus, Astrolytes	CCLXXXIV, 688, 688*a*	1899
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Noturus flavus	XXVII, 63	144
Novaculichthys infirmus	CCXLI, 606	1616
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obeyense, Etheostoma	CLXXV, 463	1092
oblongus, Paralichthys	CCCLXXIV, 924	2632
occa, Cœlorhynchus	CCCLXIX, 913	2588
Occa dodecaedron	CCCVIII, 743	2044
occidentalis, Catostomus	XXXIII, 79	178
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oceanicus, Gobius	CCCXXVII, 789, 789*a*	2230
ocellaris, Fundulus	CII, 274	642
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ocellatus, Chætodon	CCXLIX, 621	1674
Ophichthus	CCI, 524	1282
Platophrys	LXIV, 169	383
Sciænops	CCCLXXXII, 939	2663
Zenopsis	CCXXII, 567	1453
octodecimspinosus, Myoxocephalus	CCXLVI, 618	1660
octogrammus, Hexagrammos	CCXCVI, 717	1976
octonemus, Polydactylus	CCLXXX, 677	1869
oculatus, Etelis	CXXVIII, 350	830
Ocyurus chrysurus	CXCIX, 520	1275
Ogcocephalus vespertilio	CCCXCII, 958, 958*a*, 958*b*	2737
Ogilbia cayorum	CCCLV, 873	2503
ventralis	CCCLV, 872	2503
olfersi, Argyropelecus	XCVII, 261, 261*a*	604
olidus, Hypomesus	LXXXVII, 231	525
Oligocottus maculosus	CCCII, 733	2013
Oligoplites saurus	CXXXVIII, 378	898
olisthostomus, Gerres	CCXVIII, 557	1376
olivaris, Leptops	XXVII, 62	143
olmstedi, Boleosoma nigrum	CLXXI, 451	1057
omostigmum, Otophidium	CCCLIV, 869	2490
Oncocottus quadricornis	CCC, 728	2001
Oncorhynchus gorbuscha	LXXVII, 205	478
nerka	LXXVIII, 207, 207*a*, 207*b*	481
tschawytscha	LXXVII, 206	479
onitis, Tautoga	CCXXXVII, 596	1578
opalescens, Lythrulon	CCVII, 536	1312
opalinum, Myctophum	XCII, 247	571
Ophichthus guttifer	LXIV, 168	383
ocellatus	LXIV, 169	383
Ophidion elongatus	CCLXXXII, 681	1875
Opisthognathus macrognathum	CCCXXXI, 800, 800*a*	2281
Opsanus pardus	CCCXXXV, 810	2316
Opsopœodus bollmani	XLIV, 110	248
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oregonensis, Ptychocheilus	XLI, 101	224
ornatus, Pholis	CCCXLII, 833	2419
Orthodon microlepidotus	XXXIX, 96	207
Orthopristis chrysopterus	CCX, 541	1338
reddingi	CCIX, 540	1336
osculus, Opsopœodus	XLIV, 108	248
Osmerus dentex	LXXXVI, 229	524
mordax	LXXXVI, 228	523
thaleichthys	LXXXV, 227	522
osteochir, Rhombochirus	CCCXXX, 798	2273
otakii, Hexagrammos	CCLXXXI, 680	1867
Otophidium omostigmum	CCCLIV, 869	2490
Otrynter caprinus	CCXI, 543	1345
ovigerum, Bathyphasma	CCCXVIII, 767	2128
Ovoides setosus	CCLXV, 646	1739
Oxylebius pictus	CCLXXXII, 682	1878
oxyrhynchus, Acipenser sturio	XX, 45	105
pacificus, Thaleichthys	LXXXV, 226	521
pagei, Etheostoma	CLXXV, 464	1092
pagrus, Pagrus	CCXV, 551	1356
Pagrus pagrus	CCXV, 551	1356
pallasii, Clupea	LXX, 186	422
Pallasina barbata	CCCVIII, 744	2049
pallidus, Fundulus	CII, 272	638
Lepomis	CLX, 427	1005
pammelas, Melanostigma	CCCLII, 865	2479

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pantostigmius, Myrichthys	LXII, 162	2802
papilio, Melletes	CCLXXXIX, 702	1932
papillosum, Syacium	CCCLXXXIII, 941	2671
paradoxa, Garmannia	CCCXXVII, 790	2232
paradoxus, Psychrolutes	CCCVI, 740	2026
Paralabrax humeralis	CXC, 499	1196
maculatofasciatus	CXC, 498	1196
Paralepis coregonoides	XCVI, 260	602
Paralichthys dentatus	CCCLXXIII, 922	2629
oblongus	CCCLXXIV, 924	2632
squamilentus	CCCLXXIV, 923	2631
Paranthias furcifer	CXCII, 504	1221
parasiticus, Simenchelys	LVI, 144	349
pardus, Opsanus	CCCXXXV, 810	2316
parmatus, Setarches	CCLXXIX, 673	1860
parra, Hæmulon	CCIV, 530	1297
parræ, Clepticus	CCXXXVIII, 599	1586
paru, Peprilus	CL, 404	965
parva, Lucania	CIX, 292	665
paxillus, Lycenchelys	CCCLI, 860, 860*a*, 860*b*, 860*c*, 860*d*	2471
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pectoralis, Dallia	XCIX, 267	621
Nematistius	CXXXVIII, 377	895
pellucida clara, Ammocrypta	CLXXII, 454	1063
Pempheris mulleri	CLIII, 412	978
poeyi	CLIII, 413	979
peninsulæ, Bascanichthys	LXIII, 166, 166*a*	379
Menidia	CXXIV, 337	797
penna, Calamus	CCXIV, 549	1354
Peprilus paru	CL, 404	965
Perca flavescens	CLXV, 435	1023
Percina caprodes	CLXV, 436, 436*a*	1026
Percopsis guttatus	CXXI, 329	784
Peristedion gracile	CCCXXII, 776	2179
longispathum	CCCXXI, 775	2178
miniatum	CCCXXI, 774	2178
platycephalum	CCCXXII, 777, 777*a*	2180
perplexus, Cottus	CCXCIII, 709	1955
perspicillum, Lycodes	CCCL, 855	2465
perthecatus, Stolephorus	LXXIV, 196	442
Petromyzon marinus	I, 3	10
Phanerodon furcatus	CCXXX, 583	1506
phasganorus, Notacanthus	XCVIII, 265	616
Phenacobius uranops	LI, 130	304
phenax, Myeteroperca falcata	CLXXXVIII, 495	1185
philadelphicus, Centropristes	CXCI, 501	1201
philippii, Heterodontus	III, 10	
Philypnus dormitor	CCCXXIV, 781	2194
Pholis dolichogaster	CCCXLII, 831	2416
gunnellus	CCCXLII, 832	2419
ornatus	CCCXLII, 833	2419
Photonectes gracilis	XCV, 255	591
Physiculus fulvus	CCCLXIII, 896	2547
pichardi, Joturus	CXXVIII, 348	821
pictus, Chaunax	CCCLXXXIX, 953	2726
Oxylebius	CCLXXXII, 682	1878
pigmentarius, Apogon	CLXXVIII, 472	1109
Pimelometopon pulcher	CCXXXVIII, 598	1585
pingeli, Triglops	CCLXXXVII, 696	1923
pinnatus, Synaphobranchus	LVI, 146	351
pinniger, Sebastodes	CCLXXIII, 661	1793
piscatorius, Lophius	CCCLXXXVIII, 952	2713
pisonis, Eleotris	CCCXXV, 783	2200
Pisoodonophis cruentifer	LXII, 163	377
pistilliger, Gymnocanthus	CCCI, 729, 729*a*, 729*b*	2006
Placopharynx duquesnii	XXXIII, 82	198
plagiusa, Symphurus	CCCLXXXVIII, 950	2710
platessoides, Hippoglossoides	CCCLXXII, 919	2614
Platichthys stellatus	CCCLXXXI, 937, 937*a*	2652
Platophrys ocellatus	CCCLXXXII, 939	2663
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platycephalum, Peristedion	CCCXXII, 777, 777*a*	2180
platycephalus Ameiurus	XXVII, 61	142
Megalocottus	CCXCIX, 724, 724*a*	1987
Platygobio gracilis	LIV, 139	326
Plectromus crassiceps	CXXX, 356	843
suborbitalis	CXXX, 355	841
pleuriticus, Salmo clarkii	LXXX, 211	496, 2819
Pleurogrammus monopterygius	CCLXXIX, 675	1864
Pleuronectes quadrituberculatus	CCCLXXIX, 934	2648
Pleuronichthys decurrens	CCCLXXV, 926	2637
plumieri, Hæmulon	CCV, 532	1304
pocatello, Catostomus	XXXII, 76	175
Podothecus acipenserinus	CCCIX, 746	2061
accipiter	CCCVIII, 745, 745*a*	2055
veternus	CCCIX, 747, 747*a*	2063
Pœcilia presidionis	CXIV, 303	697
poeyi, Pempheris	CLIII, 413	979
Pogonias chromis	CCXXV, 573	1482
polaris, Lycodalepis	CCCL, 857	2468
Pollachius virens	CCCLIX, 886	2534
polyacanthocephalum, Bryostema	CCCXLI, 828	2408
polyacanthocephalus, Myoxocephalus	CCXCVI, 718	1976
Polydactylus octonemus	CXXVIII, 350	830
Polyodon spathula	XX. 43, 43*a*	101
Polyprion americanus	CLXXXI, 480, 480*a*	1139
Polypterus bichir	I, 2	----
Pomacanthus arcuatus	CCLI, 623	1679
zonipectus	CCLII, 624	1681
Pomatomus saltatrix	CXLVIII, 400	946
Pomolobus æstivalis	LXXI, 190	426
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mediocris	LXXI, 188	425
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pomotis, Acantharchus	CLV, 418	989
Pomoxis annularis	CLIV, 415	987
sparoides	CLIV, 416	987
Pontinus macrolepis	CCLXXVIII, 672	1855
Porichthys porosissimus	CCCXXXV, 811	2319
Porogadus miles	CCCLVIII, 881	2520
Poronotus triacanthus	CI., 405	967
porosissimus, Porichthys	CCCXXXV, 811	2319
pottsii, Etheostoma	CLXXIII, 459	1082
presidionis, Pœcilia	CXIV, 303	697
pretiosus, Hypomesus	LXXXVI, 230	525
Priacanthus arenatus	CXCV, 511	1237
princeps, Cottus	CCXCIV, 713	1962
Prionace glauca	IV, v. 16, 16*a*	33
Prionistius macellus	CCLXXXIX, 700	1928
Prionodes bulleri	CXCI, 503	1213
Prionotus alatus	CCCXIX, 770	2159
carolinus	CCCXVIII, 768	2156
evolans	CCCXX, 772	2168
scitulus	CCCXIX, 769	2157
stearnsi	CCCXX, 771	2166
Pristis pectinatus	VIII. 27	60
probatocephalus, Archosargus	CCXVI, 554	1361
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proboscideus, Chænomugil	CXXVII, 346	816
procera, Venefica	LVIII, 152	365
productus, Merluccius	CCCLIX, 884	2531
profundorum, Lepophidium	CCCLIII, 867	2484
Scylliorhinus	III, 11	22
Zesticelus	CCC, 726	1990
Promicrops itaiara	CLXXXV, 487, 487*a*, 487*b*	1162
Pronotogrammus multifasciatus	CXCII, 506	1226
proridens, Calamus	CCXIII, 547	1350
proximus, Microgadus	CCCLX, 889	2539
Psettichthys melanostictus	CCCLXXIII, 921	2618
pseudoharengus, Pomolobus	LXXI, 189	425
Pseudopleuronectes americanus	CCCLXXIX, 933	2647
Pseudopriacanthus altus	CXCV, 512	1239

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Pseudoscarus guacamaia	CCXLVI, 617	1657
Pseudotriakis microdon	IV, 14	27
psitticus, Xyrichthys	CCXLII, 607	1618
Psychrolutes paradoxus	CCCVI, 730	2026
Psychromaster tuscumbia	CLXXVI, 467	1100
Ptilichthys goodei	CCCXLVII, 848	2452
Ptychocheilus oregonensis	XLI, 101	224
pugetensis, Chitonotus	CCLXXXIII, 686	1890
pulcher, Pimelometopon	CCXXXVIII, 598	1585
pulvereus, Fundulus	CVII, 285	652
punctatus, Bodianus fulvus	CLXXXII, 481	1146
Ictalurus	XXV, 58	134
Stichæus	CCCXLV, 841	2439
Xesurus	CCLVII, 630	1694
punctulatus, Cottus	CCXCII, 708	1948
putnami, Liopsetta	CCCLXXX, 936	2650
pygmæa, Umbra	XCIX, 268	624
quadracus, Apeltes	CXX, 322	752
quadricornis, Oncocottus	CCC, 728	2001
quadrifilis, Bathypterois	LXXXIX, 238	545
quadrituberculatus, Pleuronectes	CCCLXXIX, 934	2648
quadrocellata, Ancylopsetta	CCCLXXV, 925	2634
Quassiremus evionthas	LXIV, 167	380
quiescens, Copelandellus	CLXXVI, 468	1100
Rabirubia inermis	CXCIX, 519	1274
Rachycentron canadus	CXLVIII, 401	948
radiatus, Iridio	CCXXXIX, 600	1590
Radulinus asprellus	CCLXXXVII, 695	1920
boleoides	CCLXXXVII, 694	1919
Raja ackleyi	X, 31	70
erinacea	IX, 29	68
ocellata	X, 30	68
stellulata	XI, 32	75
raleighana, Harriota	XIX, 42	96
Ranzania truncata	CCLXVIII, 651	1755
raphidoma, Tylosurus	CXVI, 308	715
Rastrinus scutiger	CCLXXXVI, 691	1909
rathbuni, Fundulus	CV, 280	649
Mulloides	CXXXII, 361	857
rectifrenum, Eupomacentrus	CCXXXIII, 589	1757, 3176
reddingi, Orthopristis	CCIX, 540	1336
Regalecus glesne	CCCLXX, 916	2596
regalis, Cynoscion	CCXX, 562	1407
Scomberomorus	CXXXV, 369	875
regius, Urophycis	CCCLXIV, 898	2553
Remora brachyptera	CCCXXX, 797, 797*a*	2272
reticulatus, Lycodes	CCCXLIX, 854	2465
retifera, Muræna	LXVI, 173	401
retrosella, Apogon	CLXXVII, 471	1108
Rhacochilus toxotes	CCXXXI, 584	1507
Rhamphocottus richardsoni	CCCVII, 742, 742*a*, 742*b*, 742*c*	2030
Rhinichthys dulcis	LII, 132	306
Rhinobatus lentiginosus	VIII, IX, 28, 28*a*, 28*b*	62
Rhinoptera steindachneri	XVII, 38, 38*a*	91
rhodorus, Ascelichthys	CCCV, 739	2025
Rhombochirus osteochir	CCCXXX, 798	2273
rhomboides, Lagodon	CCXV, 552	1358
Rhomboplites aurorubens	CC, 521	1277
richardsoni, Astronesthes	XCIV, 252	587
Rhamphocottus	CCCVII, 742, 742*a*, 742*b*, 742*c*.	2030
rimator, Bathystoma	CCVI, 534	1308
Rimicola muscarum	CCCXXXV, 813	2338
rimosus, Etropus	CCCLXXXV, 945	2688
Rissola marginata	CCCLIII, 868	2489
rivulatus, Cirrhites	CCXXVII, 576	1491
roberti, Hyporhamphus	CXVII, 312	721
Roccus chrysops	CLXXX, 477	1132
lineatus	CLXXX, 478	1132
Roncador stearnsi	CCXXIII, 568	1457
Rondeletia bicolor	XC, 240	548
rondeletii, Exonautes	CXVIII, 317	733, 2830
Ronquilus jordani	CCCXXXII, 803	2289

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rubicundus, Acipenser	XXI, 46	106
Hypsypops	CCXXXIV, 591	1564
rupestre, Xiphidion	CCCXLIV, 838	2426
rupestris, Ambloplites	CLVI, 419, 419*a*, 419*b*, 419*c*	990
Kuhlia	CLXIII, 432	.....
Rupiscartes atlanticus	CCCXXXIX, 825	2397
rupiscartes, Moxostoma	XXXVII, 93	196
Ruscarius meanyi	CCLXXXV, 690	1908
Rutilus bicolor	XLIII, 107	244
Rypticus bistrispinus	CXCIV, 509	1233
sabina, Dasyatis	XIV, 36, 36*a*	84
suburræ, Chasmodes	CCCXXXIX, 824	2392
Saccopharynx ampullaceus	LXVI, 175	406
Sagenichthys ancylodon	CCXXI, 564	1416
saida, Borogadus	CCCLIX, 885	2533
Salmo clarkii bouvieri	LXXX, 212	496; 2819
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pleuriticus	LXXX, 211	496; 2819
spilurus	LXXIX, 210	495; 2819
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gairdneri	LXXXI, 215	497
irideus	LXXXI, 216	500
salmoides, Micropterus	CLXIII, 431	1012
saltatrix, Pomatomus	CXLVIII, 400	946
saludanus, Notropis hudsonius	XLVIII, 120	270
Salvelinus alpinus aureolus	LXXXIII, 220	511
fontinalis	LXXXII, 218	506
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sapidissima, Alosa	LXXII, 191	427
Sardinella humeralis*	LXXIII, 193	431
stolifera	LXXIII, 194	431
Sarritor frenatus	CCCX, 751	2073
satiricus, Neoclinus	CCCXXXVI, 816	2355
saurus, Elops	LXVII, 178	410
Oligoplites	CXXXVIII, 378	898
Scombresox	CXVII, 314	725
saxatilis, Abudefduf	CCXXXIV, 590	1561
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strongylocephalus	CCXLV, 615, 615*a*	.....
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schœpfi, Chilomycterus	CCLXVI, 648	1748
schœpfii, Alutera	CCLX, 635	1718
Sciænops ocellatus	CCXXII, 567	1453
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scitulus, Prionotus	CCCXIX, 768	2157
sciurus, Hæmulon	CCV, 531	1303
Scomber colias	CXXXIII, 364	866
scombrus	CXXXIII, 363	865
Scomberomorus maculatus	CXXXIV, 368	874
regalis	CXXXV, 369	875

* Plate by error labeled *Sardinella sardina*.

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scombrus, Scomber	CXXXIII, 363	865
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cristulata	CCLXXVI, 668	1841
grandicornis	CCLXXVIII, 671	1850
mystes	CCLXXVII, 670	1849
Scorpænichthys marmoratus	CCLXXXIII, 685	1889
scorpius, Myoxocephalus	CCXCV, 716	1974
scripta, Alutera	CCLX, 636	1719
scuticaris, Bascanichthys	LXIII, 165	378
scutiger, Rastrinus	CCLXXXVI, 691	1909
Scylliorhinus profundorum	III, 11	22
Scytalina cerdale	CCCXLVIII, 849, 849*a*, 849*b*	2454
Sebastes marinus	CCLXVIII, 652	1760
Sebastodes alutus	CCLXXII, 660	1790
brevispinis	CCLXXI, 657	1787
caurinus	CCLXXIV, 663	1820
ciliatus	CCLXX, 655	1783
eigenmanni	CCLXXI, 658	1789
gilberti	CCLXXV, 665	1823
hopkinsi	CCLXXII, 659	1789
maliger	CCLXXIV, 664	1822
melanops	CCLXIX, 654	1782
miniatus	CCLXXIII, 662	1794
mystinus	CCLXX, 656	1784
nigrocinctus	CCLXXVI, 667	1827
pinniger	CCLXXIII, 661	1793
serriceps	CCLXXV, 666	1827
Sebastolobus altivelis	CCLXIX, 653	1763
sectatrix, Kyphosus	CCXIX, 559	1387
Selene vomer	CXLIV, CXLV, 393, 393*a*	936
selenops, Hiodon	LXVIII, 181	414
seminolis, Fundulus	CIV, 277	647
Semotilus atromaculatus	XL, 100	222
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serriceps, Sebastodes	CCLXXV, 666	1827
Serrivomer beanii	LVIII, 153	367
Setarches parmatus	CCLXXIX, 673	1860
setiger, Dasycottus	CCC, 727	1991
setipinnis, Vomer	CXLIV, 392	934
setosus, Ovoides	CCLXV, 646	1739
shufeldti, Mancalias	CCCXC, 955	2730
shumardi, Cottogaster	CLXVIII, 444	1046
Signalosa atchafalaya	LXIX, 184	2809
signatus, Bathymaster	CCCXXXII, 802	2288
signifer, Thymallus	LXXXIII, 222	517
sigoides, Gilbertidia	CCCVI, 741	2028
silenus, Zaprora	CLII, 409	2850
silus, Argentina	LXXXVII, 232	526
Simenchelys parasiticus	LVI, 144	349
simotera, Ulocentra	CLXX, 448	1053
simula, Chalinura	CCCLXVIII, 910	2578
sinaloæ, Umbrina	CCXXIV, 571	1468
Siphostoma starksii	CXX, 325	771
siuslawi, Leuciscus	XLIII, 106	2797
sloanei, Chauliodus	XCIII, 250	585
smaragdus, Erotelis	CCCXXV, 785	2204
sordidus, Citharichthys	CCCLXXXIV, 943	2679
Verilus	CCII, 525	1284
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Sparisoma aurofrenatum	CCXLIII, 610	1634
cretense	CCXLV, 616, 616*a*	.....
hoplomystax	CCXLIV, 611	1632
sparoides, Pomoxis	CLIV, 416	987
spathula, Polyodon	XX, 43, 43*a*	101
speculigera, Lampadena	XCI, 244	561
spelæus, Amblyopsis	CXV, 307	706
spengleri, Spheroides	CCLXIV, 643	1732
Spheroides maculatus	CCLXIV, 644	1733
nephelus	CCLXIV, 642	1732

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Spheroides spengleri	CCLXIV, 643	1732
testudineus	CCLXV, 645, 645*a*	1734
Sphyræna barracuda	CXXVIII, 349	823, 2841
Sphyræna tiburo	V, 19	44
spilotus, Hypohomus	CLXVIII, 443	1043, 495
spilurus, Salmo clarkii	LXXIX, 210	2819
spiniger, Icelus	CCLXXXVI, 692	1914
splendens, Beryx	CXXXI, 357	844
Squalus acanthias	VII, 24, 24*a*	54
squamilentus, Paralichthys	CCCLXXIV, 923	2631
starksii, Siphostoma	CXX, 325	771
Stathmonotus hemphillii	CCCXL, 827	2407
stearnsi, Prionotus	CCCXX, 771	2166
Roncador	CCCXIII, 568	1457
steindachneri, Rhinoptera	XVII, 38, 38*a*	91
Steindachneria argentea	CCCLXVIII, 909	2568
Stelgis vulsus	CCCIX, 748, 748*a*	2067
stellatus, Platichthys	CCCLXXXI, 937, 937*a*	2652
stelleri, Hexagrammos	CCLXXXI, 678	1871
Myoxocephalus	CCXCVIII, 722, 722*a*, 722*b*	1981
stellifer, Fundulus	CV, 279	648
stellulata, Raja	XI, 32	75
Stenodus mackenzii	LXXVII, 204	474
Stenotomus aculeatus	CCXII, 545	1346
chrysops	CCXI, 544	1346
Stephanoberyx monæ	CXXIX, 353	836
sterletus, Averruncus	CCCX, 750, 750*a*	2071
Sternias xenostethus	CCLXXXVIII, CCLXXXIX, 699, 699*a*	1927
Stichæus punctatus	CCCXLV, 841	2439
stigmaticus, Gobius	CCCXXVI, 787	2224
stilbe, Zalocys	CXLVIII, 399	2848
stilbius, Leuroglossus	LXXXVII, 233	527
stipes, Atherina	CXXII, 332	790
Stizostedion canadense	CLXIV, 434	1022
vitreum	CLXIV, 433, 433*a*	1021
Stolephorus perthecatus	LXXIV, 196	442
stolifera, Sardinella	LXXIII, 194	431
stomias, Atheresthes	CCCLXXI, 917	2609
Chasmistes	XXXV, 86	2794
Salmo clarkii	LXXX, 213	497, 2819
Stomias ferox	XCIV, 253	588
striatus, Centropristes	CXC, 500	1199
Epinephelus	CLXXXIII, 483	1157
strongylocephalus, Scarus	CCXLV, 615, 615*a*	——
sturio oxyrhynchus, Acipenser	XX, 45	105
subbifurcata, Ulvaria	CCCXLV, 841	2440
suborbitalis, Plectromus	CXXX, 355	841
subterraneus, Typhlichthys	CXV, 306	704
sucetta Erimyzon	XXXVI, 89	185
superciliosus, Hexagrammos	CCLXXXI, 679	1872
surinamensis, Anisotremus	CCVIII, 537	1318
Lobotes	CXCIV, 510	1235
swaini, Notropis	XLIX, 125	290
Syacium papillosum	CCCLXXXIII, 941	2671
symmetricus, Apomotis	CLIX, 424	998
Symphurus marginatus	CCCLXXXVII, 949	2706
plagiusa	CCCLXXXVIII, 950	2710
williamsi	CCCLXXXVIII, 951	2711
synagris, Neomænis	CXCVIII, 518	1270
Synaphobranchus pinnatus	LVI, 146	351
Synodus fœtens	LXXXVIII, 236	538
tæniatus, Evoxymetopon	CXXXVI, 372	886
tahoensis, Catostomus	XXXII, 78	177
Talismania antillarum	LXXIV, 198	455
Tarletonbeania tenua	XCII, 248	575
Tarpon atlanticus	LXVII, 177	409
Tautoga onitis	CCXXXVII, 596	1578
Tautogolabrus adspersus	CCXXXVII, 595	1577
telescopus, Notropis	L, 126	292
tenua, Tarletonbeania	XCII, 248	575

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tenuis, Uranidea	CCXCIV, 714	1966
tenuis, Urophycis	CCCLXV, 901	2555
tergisus, Hiodon	LXVIII, 180	413
testudineus Spheroides	CCLXV, 645, 645*a*	1734
Tetragonurus cuvieri	CLII, 411	976
Tetronarce californica	XII, 34, 34*a*	77
occidentalis	XI, 33	77
Teuthis bahianus	CCLVI, CCLVII, 629, 629*a*	1693
crestonis	CCLVI, 628	1692
thaleichthys, Osmerus	LXXXV, 227	522
Thaleichthys pacificus	LXXXV, 226	521
thazard, Auxis	CXXXIII, 365	867
Theragra chalcogramma	CCCLX, 887	2535
thoburni, Alcidea	CCLXXXIII, 684	1887
Thymallus tricolor	LXXXIV, 223	518, 2871
montanus	LXXXIV, 224, 224*a*	519, 2871
signifer	LXXXIII, 222	517
Thyrina evermanni	CXXV, 340	804
tiburo, Sphyrna	V, 19	44
tigrinus, Myrichthys	LXI, 161	376
tomcod, Microgadus	CCCLX, 890	2540
toxotes, Rhacochilus	CCXXXI, 584	1507
Trachinocephalus myops	LXXXVIII, 235	533
Trachinotus carolinus	CXLVII, 398	944
culveri	CXLVII, 397	942
falcatus	CXLVI, 396	941
glaucus	CXLVI, 395	940
Trachurops crumenophthalmus	CXLI, 385	911
Trachurus trachurus	CXL, 384	910
trachurus, Trachurus	CXL, 384	910
transmontana, Columbia	CXXII, 330	784
transmontanus, Acipenser	XX, 44	104
traski, Hysterocarpus	CCXXVII, 577	1496
triacanthus, Poronotus	CL, 405	967
Trichiurus lepturus	CXXXVII, 375	889
Trichodon trichodon	CCCXXXIII, 806	2295
trichodon, Trichodon	CCCXXXIII, 806	2295
Trichopsetta ventralis	CCCLXXXIII, 940	2669
tricolor, Holacanthus	CCLIII, 625	1684
montanus, Thymallus	LXXXIV, 224, 224*a*	519, 2871
Thymallus	LXXXIV, 223	518, 2871
tricornis, Lactophrys	CCLXI, 638	1724
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Triglops beani	CCLXXXVIII, 697	1924
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scepticus	CCLXXXVIII, 698	1925
trigonus, Lactophrys	CCLXIII, 640, 640*a*	1723
triqueter, Lactophrys	CCLXI, 637	1722
tristœchus, Lepisosteus	XXII, 50	111
truncata, Ranzania	CCLXVIII, 651	1755
tschawytscha, Oncorhynchus	LXXVII, 206	479
tsiltcoosensis, Catostomus	XXXIII, 80	2793
turneri, Lycodalepis	CCCL, 858	2469
tuscumbia, Psychromaster	CLXXVI, 467	1100
Tylosurus acus	CXVI, 309	716
raphidoma	CXVI, 308	715
Typhlichthys subterraneus	CXV, 306	704
Typhlogobius californiensis	CCCXXIX, 795	2262
tyrannus, Brevoortia	LXXIII, 195	433
Ulocentra gilberti	CLXIX, 446	1049
meadiæ	CLXIX, 447	2852
simotera	CLXX, 448	1053
ulvæ, Xiphistes	CCCXLIII, 836	2423
Ulvaria subbifurcata	CCCXLV, 842	2440
umatilla, Agosia	LII, 134	313
Umbra pygmæa	XCIX, 268	624
Umbrina sinaloæ	CCXXIV, 571	1468
undecimalis, Centropomus	CLXXIX, 476	1118
undulatus, Micropogon	CCXXIV, 570	1461

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unifasciatus, Hyporhamphus	CXVI, 311	720
unimaculatus, Archosargus	CCXVI, 553	1359
Upeneus maculatus	CXXXII, 362	858
Uraleptus malardi	CCCLXII, 894	2545
Uranidea tenuis	CCXCIV, 714	1966
uranops, Phenacobius	LI, 130	304
Urophycis chesteri	CCCLXVI, 903	2556
chuss	CCCLXV, 902	2555
cirratus	CCCLXIV, 899	2553
earlli	CCCLXV, 900	2554
regius	CCCLXIV, 898	2553
tenuis	CCCLXV, 901	2555
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vagrans, Kirtlandia	CXXIV, 336	794
variatus, Characodon	CXI, 295, 295*a*	669
variegatus, Cyprinodon	CXI, CXII, 296, 296*a*	671
velifer, Letharchus	LXI, 160	375
Venefica procera	LVIII, 152	365
venenosa, Mycteroperca	CLXXXVII, 491	1172
ventralis, Novacuilichthys	CCXLI, 605	1615
Ogilbia	CCCLV, 872	2503
Trichopsetta	CCCLXXXIII, 940	2669
venusta, Emmeekia	CCXL, 603	1602
Verilus sordidus	CCII, 525	1284
Verma kendalli	LX, 159, 159*a*	375
verrillii, Lycenchelys	CCCLI. 859	2470
verrucosus, Myoxocephalus	CCXCVII, 720, 720*a*	1979
vespertilio, Ogcocephalus	CCCXCII, 958–958*b*	2727
veternus, Podothecus	CCCIX, 747, 747*a*	2063
villosus, Mallotus	LXXXV, 225	520
vinolentus, Lethotremus	CCCXIV, 759	2101
viola, Antimora	CCCLXII, 893, 893*a*	2544
violaceus, Escolar	CXXXV, 370	878 2843
virens, Pollachius	CCCLIX, 886	2534
virgatum, Etheostoma	CLXXV, 465	1093
virginalis, Salmo clarkii	LXXIX, 209	495 2819
virginicus, Anisotremus	CCIX, 539	1322
viridis, Evoplites	CXCVI, 514	1246
Gymnelis	CCCLII, 864–864*c*	2479
vitreum, Stizostedion	CLXIV, 433, 433*a*	1021
vittata, Channomuræna	LXVI, 174	404
vivanus, Hemianthias	CXCII, 505	1223
volitans, Cephalacanthus	CCCXXIII, 778	2183
Exocœtus	CXVIII, 318	734
vomer, Selene	CXLIV, CXLV, 393, 393*a*	936
Vomer setipinnis	CXLIV, 392	934
vulpes, Albula	LXVIII. 179	411
Alopias	VI, 20	45
vulsus, Stelgis	CCCIX, 748, 748*a*	2067
watauga, Hybopsis	LIII, 137	319
welaka, Notropis	XLV, 113	2799
whipplii, Notropis	XLVIII, 121	278
williamsi, Symphurus	CCCLXXXVIII, 951	2711
willoughbyi, Acrotus	CLI, 408	973
xanthurus, Leiostomus	CCXXIII, 569	1458
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NOTE.—The actual size of the specimen from which each illustration was drawn may, in most instances, be determined by the use of the inch mark beneath the engraving, which, in the photographic reduction of the drawing, is reduced in the same proportion as the drawing itself.

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Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Tellico River, Tellico Plains, Tennessee.

127. **Notropis notemigonoides** Evermann 292
Drawing by A. H. Baldwin from the type, No. 45559, U.S.N.M., collected by Evermann, Scovell, and Gurley in Neches River, near Palestine, Texas.

128. **Notropis metallicus** Jordan and Meek 297
Drawing by A. H. Baldwin from a specimen collected by A. J. Woolman in the Withlacoochee River, near Richland, Florida.

PLATE LI.

129. **Ericymba buccata** Cope 302
Drawing by A. H. Baldwin from No. 36803, U.S.N.M., collected by Dr. Meek in Lost Creek, near Defiance, Ohio.

130. **Phenacobius uranops** Cope 304
Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Chickamauga Creek, Lee & Gordon's mill, Georgia.

131. **Evarra eigenmanni** Woolman 304
Drawing by A. H. Baldwin from the type, No. 45571, U.S.N.M., collected by Woolman and Cox at the City of Mexico.

PLATE LII.

132. **Rhinichthys dulcis** (Girard) 306
Drawing by S. F. Denton from a specimen collected by Dr. Jordan in Yellowstone Park.

133. **Agosia klamathensis** Evermann and Meek 3144
Drawing by A. H. Baldwin from the type, No. 48225, U.S.N.M., collected by Meek and Alexander in Upper Klamath Lake, Oregon.

134. **Agosia umatilla** Gilbert and Evermann 313
Drawing by A. H. Baldwin from the type, No. 45390, U.S.N.M., collected by Gilbert and Rutter in the Columbia River at Umatilla, Oregon.

PLATE LIII.

135. **Agosia falcata** Eigenmann and Eigenmann 313
Drawing by A. H. Baldwin from the type collected by C. H. Eigenmann in Boise River near Caldwell, Idaho.

136. **Hybopsis æstivalis marconis** Jordan and Gilbert 316
Drawing by A. H. Baldwin from a specimen collected in the San Marcos River, San Marcos, Texas, by Evermann, Scovell, and Gurley.

137. **Hybopsis watauga** Jordan and Evermann 319
Drawing by S. F. Denton from the type, No. 39929, U.S.N.M., collected by Jordan and Evermann in the Watauga River near Elizabethtown, Tennessee.

PLATE LIV.

Text page.

138. **Hybopsis altus** (Jordan) 321
Drawing by H. L. Todd from the type, No. 23125, U.S.N.M., collected in Lake Tupataro, Guanajuato, Mexico, by Prof. A. Dugès.

139. **Platygobio gracilis** (Richardson) 326
Drawing by A. H. Baldwin from a specimen collected by Evermann, Cox, and Rutter in White River near Chamberlain, South Dakota.

140. **Exoglossum maxillingua** (Le Sueur) 327
Drawing by Anna L. Brown.

PLATE LV.

141. **Brycon dentex** Günther 337
Drawing by A. H. Baldwin from No. 39909, U.S.N.M., collected by Dr. L. E. H. Best in Nicaragua.

142. **Derichthys serpentinus** Gill 343
Drawing by H. L. Todd from the type collected by the *Albatross* in the Gulf Stream at Station 2094 in 1,022 fathoms.

143. **Anguilla chrysypa** Rafinesque 348
Drawing by H. L. Todd from No. 20470, U.S.N.M., collected at Holyoke, Massachusetts.

PLATE LVI.

144. **Simenchelys parasiticus** Gill 349
Drawing by H. L. Todd from No. 21673, U.S.N.M., collected by Capt. N. McPhee near Sable Island Bank.

145. **Ilyophis brunneus** Gilbert 350
Drawing by A. H. Baldwin from the type collected by the *Albatross* at Chatham Island.

146. **Synaphobranchus pinnatus** (Gronow) 351
Drawing by H. L. Todd from No. 21681, U.S.N.M., collected by Captain Olsen on Le Have Bank.

PLATE LVII.

147. **Histiobranchus infernalis** Gill 352
Drawing by H. L. Todd from No. 38205, U.S.N.M., collected by the *Albatross* in lat. 36° 35′ N., long. 74° 03′ 30″ W.

148. **Leptocephalus conger** (Linnæus) 354
Drawing by H. L. Todd from No. 16027, U.S.N.M., collected at Noank, Connecticut, by J. W. Latham.

149. **Leptocephalus caudilimbatus** (Poey) 355
Drawing by H. L. Todd from the type of *Conger caudicula* Bean, No. 30709, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

PLATE LVIII.

Text page.

150. **Congrellus flavus** (Goode and Bean) 357
Drawing by H. L. Todd from the type, No. 44612, U.S.N.M., collected by the *Albatross* in the Gulf Stream.

151. **Hoplunnis schmidtii** Kaup 361
Drawing by J. C. Van Hook from No. 44240, U.S.N.M., collected by the *Albatross* at Station 2402.

152. **Venefica procera** Goode and Bean 365
Drawing by H. L. Todd from a specimen collected in the Gulf Stream.

153. **Serrivomer beanii** Gill and Ryder 367
Drawing by A. H. Baldwin from the type, No. 33383, U.S.N.M., collected by the *Albatross* in the Gulf Stream.

PLATE LIX.

154. **Avocettina gillii** Bean 367; 2801
Drawing by A. H. Baldwin from the type, No. 44239, U.S.N.M., collected by the *Albatross* east of Prince of Wales Island, Alaska, at Station 2859.

154*a*, 154*b*. **Avocettina gillii** Bean 2801
Drawings by Anna L. Brown from No. 679, L. S. Jr. Univ. Mus., collected by the *Albatross* at Station 2860.

155. **Labichthys carinatus** Gill and Ryder 368
Drawing by A. H. Baldwin from the type, No. 33369, U.S.N.M., collected by the *Albatross* at Station 2076 in the Gulf Stream.

156. **Labichthys elongatus** Gill and Ryder 369
Drawing by A. H. Baldwin from the type, No. 33755, U.S.N.M., collected by the *Albatross* at Station 2100 in the Gulf Stream.

PLATE LX.

157, 157*a*, 157*b*. **Nemichthys avocetta** Jordan and Gilbert 369
Drawings by Anna L. Brown from a specimen in the Provincial Museum at Victoria, British Columbia, collected by M. W. Norgate, at Beacon Hill, near Victoria.

158. **Ahlia egmontis** (Jordan) 370
Drawing by H. L. Todd from the type, No. 35086, U.S.N.M., collected by Dr. Jordan at Egmont Key, Florida.

159. **Verma kendalli** (Gilbert) 375
Drawings by A. H. Baldwin from the type, No. 44304, U.S.N.M., collected by W. C. Kendall off west coast of Florida.

PLATE LXI.

160. **Letharchus velifer** Goode and Bean 375
Drawing by H. L. Todd from the type, No. 31458, U.S.N.M., collected by Kaiser and Martin, on west coast of Florida.

161. **Myrichthys tigrinus** Girard 376
Drawing by A. H. Baldwin.

PLATE LXII.

Text page.

162. **Myrichthys pantostigmius** Jordan and McGregor 2802
Drawing by W. S. Atkinson from the type, No. 5710, L. S. Jr. Univ. Mus., collected by R. C. McGregor, at Clarion Island.

163. **Pisoodonophis cruentifer** Goode and Bean 377
Drawing by A. H. Baldwin from the type, No. 28938, U.S.N.M., collected by the *Fish Hawk*.

PLATE LXIII.

164. **Calechelys muræna** Jordan and Evermann 378
Drawing by A. H. Baldwin from the type, No. 37996, U.S.N.M., collected by Silas Stearns at the Pensacola Snapper Banks.

165. **Bascanichthys scuticaris** (Goode and Bean) 378
Drawing by H. L. Todd from the type of *Sphagebranchus teres* Goode and Bean, No. 31457, U.S.N.M., collected by Kaiser and Martin on west coast of Florida.

166, 166*a*. **Bascanichthys peninsulæ** (Gilbert) 379
Drawings by A. H. Baldwin from the type, No. 44297, U.S.N.M., collected by the *Albatross* in La Paz Bay, Lower California.

PLATE LXIV.

167. **Quassiremus evionthas** (Jordan and Bollman) 380
Drawing by A. H. Baldwin.

168. **Ophichthus guttifer** (Bean and Dresel) 383
Drawing by H. L. Todd from the type, No. 32647, U.S.N.M., collected by Silas Stearns on the Pensacola Snapper Banks.

169. **Ophichthus ocellatus** (Le Sueur) 383
Drawing by H. L. Todd from No. 22289, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

PLATE LXV.

170. **Mystriophis intertinctus** (Richardson) 386
Drawing by H. L. Todd from No. 22865, U.S.N.M., collected by Kaiser and Martin on west coast of Florida.

171. **Lycodontis moringa** (Cuvier) 395
Drawing by H. L. Todd from No. 6994, U.S.N.M., collected at Garden Key, Florida.

172. **Muræna insularum** Jordan and Davis 400
Drawing by A. H. Baldwin.

PLATE LXVI.

173. **Muræna retifera** Goode and Bean 401
Drawing by H. L. Todd from the type, No. 31393, U.S.N.M., collected by C. C. Leslie, at Charleston, South Carolina.

174. **Channomuræna vittata** (Richardson) 404
Drawing by A. H. Baldwin.

175. **Saccopharynx ampullaceus** (Harwood) 406
Drawing from Günther, Challenger Report, Vol. XXII, Pl. LXVI.

PLATE LXVII.

Text page.

176. **Gastrostomus bairdii** Gill and Ryder 406
Drawing by H. L. Todd from No. 33386, U.S.N.M., collected by the *Albatross* at Station 2074, in N. lat. 41° 43′, W. long. 65° 21′ 50″, at a depth of 1,309 fathoms.

177. **Tarpon atlanticus** (Cuvier and Valenciennes) 409
Drawing by H. L. Todd.

178. **Elops saurus** Linnæus 410
Drawing by H. L. Todd.

PLATE LXVIII.

179. **Albula vulpes** (Linnæus) 411
Drawing by H. L. Todd.

180. **Hiodon tergisus** Le Sueur 413
Drawing by H. L. Todd from No. 8710, U.S.N.M., collected by George Clark, at Ecorse, Michigan.

181. **Hiodon selenops** Jordan and Bean 414
Drawing by H. L. Todd from the type, No. 19844, U.S.N.M., collected by Daniel J. Duffy, at Chattanooga, Tennessee.

PLATE LXIX.

182. **Chanos chanos** (Forskål) 414
Drawing by A. H. Baldwin from No. 28240, U.S.N.M., collected by Dr. Gilbert at Mazatlan, Mexico.

183. **Dorosoma cepedianum** (Le Sueur) 416
Drawing by H. L. Todd.

184. **Signalosa atchafalayæ** Evermann and Kendall 2809
Drawing by A. H. Baldwin from the type, No. 48790, U.S.N.M., collected by Fred M. Chamberlain in the Atchafalaya River at Melville, Louisiana.

PLATE LXX.

185. **Clupea harengus** Linnæus 421
Drawing by H. L. Todd.

186. **Clupea pallasii** Cuvier and Valenciennes 422
Drawing by H. L. Todd from No. 27718, U.S.N.M., collected by L. Bailey at Unalaska.

187. **Pomolobus chrysochloris** Rafinesque 425
Drawing by H. L. Todd from No. 30159, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

PLATE LXXI.

188. **Pomolobus mediocris** (Mitchill) 425
Drawing by H. L. Todd from No. 25132, U.S.N.M., collected at Washington market by Dr. Bean.

Text page.

189. **Pomolobus pseudoharengus** (Wilson) 426
Drawing by H. L. Todd from No. 25197, U.S.N.M., collected at Washington market.

190. **Pomolobus æstivalis** (Mitchill) 426
Drawing by H. L. Todd from No. 32639, U.S.N.M., collected at Washington market.

PLATE LXXII.

191. **Alosa sapidissima** (Wilson) 427
Drawing by H. L. Todd from No. 25099, U.S.N.M., collected by U. S. F. C. at Norfolk, Virginia.

192, 192*a*. **Alosa alabamæ** Jordan and Evermann 2810
Drawings by A. H. Baldwin from the types, Nos. 47690, male, and 47689, female, U.S.N.M., collected by J. N. Fitts in Black Warrior River, at Tuscaloosa, Alabama.

PLATE LXXIII.

193. **Sardinella humeralis** (Cuvier & Valenciennes) 431
Drawing by H. L. Todd from the type of *Harengula pensacolæ* Goode and Bean, No. 22831, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

194. **Sardinella stolifera** (Jordan and Gilbert) 431
Drawing by Anna L. Brown from No. 2693, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

195. **Brevoortia tyrannus** (Latrobe) 433
Drawing by H. L. Todd from No. 20666, U.S.N.M., collected at Woods Hole, Massachusetts.

PLATE LXXIV.

196. **Stolephorus perthecatus** Goode and Bean 442
Drawing by H. L. Todd from No. 30483, U.S.N.M., collected by Silas Stearns in south Florida.

197. **Alepocephalus agassizii** Goode and Bean 453
Drawing by H. L. Todd from No. CCCXXXVIII, M. C. Z., collected by A. Agassiz in N. lat. 38° 18′ 40″, W. long. 73° 18′ 10″, at a depth of 922 fathoms.

198. **Talismania antillarum** Goode and Bean 455
Drawing by M. M. Smith from the type, No. 43739, U.S.N.M., collected by the *Albatross* at Station 2394, in N. lat. 28° 38′ 30″, W. long. 87° 02′, at a depth of 420 fathoms.

PLATE LXXV.

199. **Aleposomus copei** Gill 459
Drawing by H. L. Todd from the type, No. 33551, U.S.N.M., collected by the *Albatross* at Station 2099, in N. lat. 37° 12′ 20″, W. long. 69° 39′, at a depth of 2,949 fathoms.

Text page.

200. **Coregonus williamsoni** Girard 463
Drawing by A. H. Baldwin from a breeding male collected by B. A. Bean in Little Spokane River, near Clarks Spring, Washington.

200*a*. **Coregonus williamsoni** Girard 463
Drawing by A. H. Baldwin from a young individual collected by Dr. Evermann in Montana.

PLATE LXXVI.

201. **Coregonus coulterii** Eigenmann and Eigenmann 462
Drawing by A. H. Baldwin from the type, No. 44875, U.S. N.M., collected by Dr. Eigenmann in the Kicking Horse River at Field, British Columbia.

202. **Coregonus clupeiformis** (Mitchill) 465
Drawing by H. L. Todd from No. 10300, U.S.N.M., collected by George Clark at Ecorse, Michigan.

203. **Argyrosomus nigripinnis** Gill 472
Drawing by A. H. Baldwin from a nearly ripe male collected in Lake Michigan, off Sheboygan, Wisconsin, in 90 fathoms.

PLATE LXXVII.

204. **Stenodus mackenzii** (Richardson) 474
Drawing from No. 29889, U.S.N.M., collected at Nulato, Alaska, by E. W. Nelson.

205. **Oncorhynchus gorbuscha** (Walbaum) 478
Drawing by H. L. Todd from No. 27743, U.S.N.M., collected by Dr. Bean in Cooks Inlet, Alaska.

206. **Oncorhynchus tschawytscha** (Walbaum) 479
Drawing by H. L. Todd.

PLATE LXXVIII.

207. **Oncorhynchus nerka** (Walbaum) 481
Drawing by A. H. Baldwin from a male specimen of the large form collected by T. M. Williams at Big Payette Lake, Idaho.

207*a*. **Oncorhynchus nerka** (Walbaum) 481
Drawing by A. H. Baldwin from a female specimen of the small form collected by Dr. Evermann at Alturas Lake, Idaho.

207*b*. **Oncorhynchus nerka** (Walbaum) 481
Drawing by A. H. Baldwin from a mutilated male specimen of the small form collected by Dr. Evermann at Alturas Lake, Idaho.

PLATE LXXIX.

208. **Salmo clarkii henshawi** (Gill and Jordan) 493; 2819
Drawing by S. F. Denton from No. 17086, U.S.N.M., collected by H. W. Henshaw in Lake Tahoe, California.

Text page.

209. **Salmo clarkii virginalis** (Girard) 495; 2819
Drawing by S. F. Denton from a specimen collected by Peter Madsen in Utah Lake, Utah.

210. **Salmo clarkii spilurus** (Cope) 495; 2819
Drawing by S. F. Denton from a specimen collected by Jordan and Evermann at Del Norte, Colorado.

PLATE LXXX.

211. **Salmo clarkii pleuriticus** (Cope) 496; 2819
Drawing by S. F. Denton from specimen collected by Jordan and Evermann at Trappers Lake, Colorado.

212. **Salmo clarkii bouvieri** (Bendire) 496; 2819
Drawing by S. F. Denton from the type, collected by Capt. Charles Bendire at Waha Lake, Idaho.

213. **Salmo clarkii stomias** (Cope) 497; 2819
Drawing by S. F. Denton from a specimen collected by Jordan and Evermann at Twin Lakes, Colorado.

PLATE LXXXI.

214. **Salmo clarkii macdonaldi** Jordan and Evermann 497; 2819
Drawing by S. F. Denton from the type, No. 41730, U.S.N.M., collected by George Fisher in Twin Lakes, Colorado.

215. **Salmo gairdneri** Richardson 497

216. **Salmo irideus** Gibbons 500
Drawing by S. F. Denton from No. 37782, U.S.N.M., a male example, collected by William Montgomery at Verona, Missouri, where the species had been introduced.

PLATE LXXXII.

217. **Cristivomer namaycush** (Walbaum) 504
Drawing by S. F. Denton.

218. **Salvelinus fontinalis** (Mitchill) 506
Drawing by H. L. Todd from No. 28651, U.S.N.M., collected by E. G. Blackford.

219. **Salvelinus malma** (Walbaum) 507
Drawing by H. L. Todd from No. 27740, U.S.N.M., collected by T. H. Bean in Cooks Inlet.

PLATE LXXXIII.

220. **Salvelinus alpinus aureolus** (Bean) 511
Drawing by H. L. Todd from No. 39899, U.S.N.M., a female, collected by E. B. Hodge at Sunapee Lake, New Hampshire.

221. **Salvelinus oquassa** (Girard) 514
Drawing by H. L. Todd from No. 20688, U.S.N.M., collected by E. G. Blackford at Oquassa Lake, Maine.

222. **Thymallus signifer** (Richardson) 517
Drawing by H. L. Todd from a specimen collected by E. W. Nelson at Nulato, Alaska.

PLATE LXXXIV.

Text page.

223. **Thymallus tricolor** Cope 518; 2871
Drawing by H. L. Todd from No. 11115, U.S.N.M., collected by J. W. Milner in Ausable River, Michigan.

224. **Thymallus tricolor montanus** (Milner) 519; 2871
Drawing by S. F. Denton from a specimen collected by Dr. Jordan at Horsethief Springs, Montana.

224*a*. **Thymallus tricolor montanus** (Milner) 519; 2871
Drawing by A. H. Baldwin from a young example collected in the Yellowstone Park by Dr. Evermann.

PLATE LXXXV.

225. **Mallotus villosus** (Müller) 520
Drawing by H. L. Todd from No. 3418, U.S.N.M., collected by Dr. E. Coues in Grosswater Bay.

226. **Thaleichthys pacificus** (Richardson) 521
Drawing by H. L. Todd from No. 28001, U.S.N.M., collected by Marcus Baker in Chilkat River, Alaska.

227. **Osmerus thaleichthys** Ayres 522
Drawing by H. L. Todd from No. 28087, U.S.N.M., collected by Dr. Bean at San Francisco, California.

PLATE LXXXVI.

228. **Osmerus mordax** (Mitchill) 523
Drawing by H. L. Todd from No. 21435, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

229. **Osmerus dentex** Steindachner 524
Drawing by H. L. Todd from No. 27914, U.S.N.M., collected at Port Clarence, Alaska, by Dr. Bean.

230. **Hypomesus pretiosus** (Girard) 525
Drawing by H. L. Todd from No. 27995, U.S.N.M., collected in Yakutat Bay, Alaska, by Dr. Bean.

PLATE LXXXVII.

231. **Hypomesus olidus** (Pallas) 525
Drawing by H. L. Todd from No. 23973, U.S.N.M., collected by L. M. Turner at St. Michaels, Alaska.

232. **Argentina silus** Ascanius 526
Drawing by H. L. Todd from No. 37801, U.S.N.M., collected by E. H. Bunker at Biddeford Pool, Maine.

233. **Leuroglossus stilbius** Gilbert 527
Drawing by A. H. Baldwin from the type, No. 44283, U.S.N.M., collected by the *Albatross* at Station 2997 in 221 fathoms.

PLATE LXXXVIII.

234. **Bathylagus benedicti** Goode and Bean 529
Drawing by A. H. Baldwin from a specimen collected by the *Albatross* at Station 2711, in N. lat. 38° 59′, W. long. 70° 07′, in 1,344 fathoms.

Text page.

235. **Trachinocephalus myops** (Forster) 533
Drawing by H. L. Todd.

236. **Synodus fœtens** (Linnæus) 538
Drawing by H. L. Todd from No. 25998, U.S.N.M., collected by C. C. Leslie at Charleston, South Carolina.

PLATE LXXXIX.

237. **Benthosaurus grallator** Goode and Bean 543
Drawing by H. L. Todd from a specimen collected by the *Blake* at Station CLXXIV, in N. lat. 24° 23′, W. long. 84° 23′, in 1,850 fathoms.

238. **Bathypterois quadrifilis** Günther 545
Drawing by A. H. Baldwin from a specimen collected by the *Blake* at Station XCVIII, off St. Vincent.

239. **Ipnops murrayi** Günther 547
Drawing by H. L. Todd from a specimen collected by the *Blake* at Station CCXXXIII, in N. lat. 24° 36′, W. long. 84° 5′, in 955 fathoms.

PLATE XC.

240. **Rondeletia bicolor** Goode and Bean 548
Drawing by H. L. Todd from the type, No. 38202, U.S.N.M., collected by the *Albatross* at Station 2206, in N. lat. 36° 47′, W. long. 73° 25′, in 1,641 fathoms.

241. **Cetomimus gillii** Goode and Bean 549
Drawing by M. M. Smith from the type, No. 35529, U.S.N.M., collected by the *Albatross* at Station 2206, in N. lat. 39° 35′, W. long. 71° 24′ 30″, in 1,043 fathoms.

242. **Ceratoscopelus madeirensis** (Lowe) 557
Drawing by J. C. Van Hook from No. 43776, U.S.N.M., collected by the *Albatross* at Station 2528, in N. lat. 41° 47′ W. long. 65° 37′ 30″, in 677 fathoms.

PLATE XCI.

243. **Lampanyctus crocodilus** (Risso) 558
Drawing by A. H. Baldwin from a specimen collected at Nice, and obtained by the U.S.N.M. through the Royal Zoological Museum at Florence, Italy.

244. **Lampadena speculigera** Goode and Bean 561
Drawing by J. C. Van Hook from the type, No. 43797, U.S.N.M., collected by the *Fish Hawk* at Station 797, off Newport, Rhode Island, in 16.5 fathoms.

245. **Nannobrachium macdonaldi** Goode and Bean 563
Drawing by S. F. Denton from No. 35445, U.S.N.M., collected by the *Albatross* at Station 2182, in N. lat. 39° 25′ 30″, W. long. 71° 44′, in 861 fathoms.

PLATE XCII.

Text page.

246. **Æthoprora lucida** Goode and Bean 565
Drawing by A. H. Baldwin from No. 44084, U.S.N.M., collected by the *Albatross* at Station 2127, in N. lat. 19° 45′, W. long. 75° 04′, in 1639 fathoms.

247. **Myctophum opalinum** Goode and Bean 571
Drawing by J. C. Van Hook from No. 43798, U.S.N.M., collected by the *Albatross* at Station 2585, in N. lat. 39° 08′ 30″, W. long. 72° 17′, in 542 fathoms.

248. **Tarletonbeania tenua** Eigenmann and Eigenmann 575
Drawing by A. H. Baldwin from No. 41882, U.S.N.M., collected by C. H. Eigenmann off Point Loma, near San Diego, California.

PLATE XCIII.

249. **Yarrella blackfordii** Goode and Bean 584
Drawing by A. H. Baldwin from the type, No. 44242, U.S.N.M., collected by the *Albatross* at Station 2376, in N. lat. 29° 03′ 15″, W. long. 88° 16′, in 324 fathoms.

250. **Chauliodus sloanei** Bloch and Schneider 585
Drawing by H. L. Todd from No. 23420, U.S.N.M., collected by Capt. Charles Anderson and crew, of the Gloucester fishing fleet, in N. lat. 42° 08′, W. long. 65° 35′, in 185 fathoms.

251. **Astronesthes gemmifer** Goode and Bean 586
Drawing by A. H. Baldwin from the type, No. 24645, U.S.N.M., collected by the schooner *Polar Wave* from the stomach of a halibut, in N. lat. 44° 25′, W. long. 53° 12′, in 300 fathoms.

PLATE XCIV.

252. **Astronesthes richardsoni** Poey 587
Drawing by M. M. Smith from No. 35540, U.S.N.M., collected by the *Albatross* at Station 2202, in N. lat. 39° 38′, W. long. 71° 39′ 45″, in 515 fathoms.

253. **Stomias ferox** Reinhardt 588
Drawing by H. L. Todd from No. 23360, U.S.N.M., collected by Capt. David Cammel and crew, of the Gloucester fishing fleet, at East Banquereux.

254. **Grammatostomias dentatus** Goode and Bean 590
Drawing by H. L. Todd from the type, No. 37370, U.S.N.M., collected by the *Albatross*, at Station 2565, in N. lat. 38° 19′ 20″, W. long. 69° 02′ 30″, in 2069 fathoms.

PLATE XCV.

255. **Photonectes graciles** Goode and Bean 591
Drawing by M. M. Smith from the type, collected by the *Blake* at Station XL, off Martinique, in 472 fathoms.

Text page.

256. **Malacosteus niger** Ayres 593
Drawing by H. L. Todd, from No. 32169, U.S.N.M., collected by Capt. Charles Anderson and crew, of the schooner *Alice G. Wonson*, on the northeastern edge of Georges Bank, in 125 fathoms.

257. **Alepisaurus ferox** Lowe 595
Drawing by H. L. Todd from No. 20593, U.S.N.M., obtained in the New York market by E. G. Blackford.

PLATE XCVI.

258. **Alepisaurus æsculapius** (Bean) 595
Drawing by H. L. Todd from the type, No. 27705, U.S.N.M., collected by Robert King at Unalaska, Alaska.

259. **Arctozenus coruscans** (Jordan & Gilbert) 601
Drawing by A. H. Baldwin from the type, No. 27171, U.S.N.M., collected by Mr. Brown, at Port Townsend, Washington.

260. **Paralepis coregonoides** Risso 602
Drawing by H. L. Todd from a specimen in the Academy of Natural Sciences of Montreal.

PLATE XCVII.

261, 261*a*. **Argyropelecus olfersi** (Cuvier) 604
Drawings by H. L. Todd from No. 33393, U. S. N. M., collected by the *Albatross* in N. lat. 41° 40′ 30″, W. long. 65° 35′, in 855 fathoms.

PLATE XCVIII.

262. **Aldrovandia macrochir** (Günther) 609
Drawing by H. L. Todd from a specimen collected by the *Blake* at Station LIII, off Havana, in 242 fathoms.

263. **Aldrovandia gracilis** Goode and Bean 610
Drawing by S. F. Denton, from a specimen collected by the *Blake* at Station LXX, off Guadaloupe, in 769 fathoms.

264. **Notacanthus analis** Gill 615
Drawing by H. L. Todd from the type, No. 37856, U.S.N.M., collected by the *Albatross* at Station 2677, in N. lat. 32° 39′, W. long. 76° 50′ 30″, in 478 fathoms.

265. **Notacanthus phasganorus** Goode 616
Drawing by H. L. Todd from the type, No. 25972, U.S.N.M., collected by Capt. Briggs Gilpatrick, of the schooner *Gatherer*, from the stomach of a ground shark, on the Grand Bank.

PLATE XCIX.

266. **Lipogenys gillii** Goode and Bean 619
Drawing by H. L. Todd from the type, No. 39212, U.S.N.M., collected by the *Albatross* at Station 2742, in N. lat. 37° 46′ 30″, W. long. 73° 56′ 30″, in 865 fathoms.

Text page.

267. **Dallia pectoralis** Bean 621
Drawing by H. L. Todd from the type, No. 23498, U.S.N.M., collected by L. M. Turner, at St. Michaels, Alaska.

268. **Umbra pygmæa** (De Kay) 624
Drawing by H. L. Todd from No. 34886, U.S.N.M., collected in New Jersey.

PLATE C.

269, 269*a*. **Lucius lucius** (Linnæus) 628
Drawings by H. L. Todd from No. 9389, U.S.N.M., collected at Ecorse, Michigan.

270. **Lucius masquinongy** (Mitchill) 629
Drawing by H. L. Todd from No. 10607, U.S.N.M., collected by Geo. Clark at Ecorse, Michigan.

PLATE CI.

271, 271*a*. **Fundulus majalis** (Walbaum) 639
Drawings by H. L. Todd from No. 13788, U.S.N.M. (female and male), collected by the U. S. Fish Commission at Woods Hole, Massachusetts.

271*b*. **Fundulus majalis** (Walbaum) 639
Drawing by A. H. Baldwin from a young example collected by H. M. Smith at St. George Island, Maryland.

PLATE CII.

272. **Fundulus pallidus** Evermann 638
Drawing by A. H. Baldwin from the type, No. 45564, U.S.N.M., collected by Evermann, Scovell, and Gurley in Galveston Bay, near Swan Lake, Galveston, Texas.

273. **Fundulus heteroclitus** (Linnæus) 640
Drawing by A. H. Baldwin from a male example collected by H. M. Smith at St. George Island, Maryland.

274. **Fundulus ocellaris** Jordan and Gilbert 642
Drawing by A. H. Baldwin from a specimen collected in the Withlacoochee River, Florida, by A. J. Woolman.

PLATE CIII.

275. **Fundulus diaphanus** (Le Sueur) 645
Drawing by A. H. Baldwin from a male example collected by H. M. Smith at St. George Island, Maryland.

275*a*. **Fundulus diaphanus** (Le Sueur) 645
Drawing by A. H. Baldwin from a female example collected by H. M. Smith at St. George Island, Maryland.

276. **Fundulus zebrinus** Jordan and Gilbert 646
Drawing by H. L. Todd from No. 36610, U.S.N.M., collected at Ellis, Kansas, by F. W. Cragin.

PLATE CIV.

Text page.

277. **Fundulus seminolis** Girard 647
Drawing by A. H. Baldwin from a specimen collected in Charlie Apopka Creek, Florida, by A. J. Woolman.

278. **Fundulus catenatus** (Storer) 648
Drawing by A. H. Baldwin from a male example collected by Dr. Gurley in Ball Creek, near Tazewell, Tennessee.

278*a*. **Fundulus catenatus** (Storer) 648
Drawing by H. L. Todd from No. 36456, U.S.N.M., collected by Jordan and Gilbert in Saline River, Benton, Arkansas.

PLATE CV.

279. **Fundulus stellifer** (Jordan) 648
Drawing by H. L. Todd from No. 17888, U.S.N.M., collected by Dr. Jordan in Etowa River, Rome, Georgia.

280. **Fundulus rathbuni** Jordan and Meek 649
Drawing by S. F. Denton from the type, No. 39860, U.S.N.M., collected in Allemance Creek, Greensboro, North Carolina, by Jordan, Jenkins, and Meek.

281. **Fundulus albolineatus** Gilbert 649
Drawing by S. F. Denton from the type, collected by P. H. Kirsch in Spring Creek, Huntsville, Alabama.

PLATE CVI.

282. **Fundulus funduloides** (Evermann) 650
Drawing by A. H. Baldwin from the type, No. 45563, U.S.N.M., collected by Evermann, Scovell, and Gurley in Dickinson Bayou, near Galveston, Texas.

283. **Fundulus macdonaldi** (Meek) 651
Drawing by S. F. Denton from the type collected by Meek, Drew, and Rettger in Jones Creek, Dixon, Missouri.

284. **Fundulus jenkinsi** Evermann 651
Drawing by A. H. Baldwin from the type, No. 45562, U.S.N.M., collected by Evermann, Scovell, and Gurley in Dickinson Bayou, near Galveston, Texas.

PLATE CVII.

285. **Fundulus pulvereus** (Evermann) 652
Drawing by A. H. Baldwin from the type, No. 45561, U.S.N.M., collected in Dickinson Bayou, near Galveston, Texas, by Evermann, Scovell, and Gurley.

286. **Fundulus luciæ** (Baird) 654
Drawing by A. H. Baldwin from a specimen collected by H. M. Smith at St. George Island, Maryland.

287. **Fundulus chrysotus** Holbrook 655
Drawing by A. H. Baldwin from a specimen collected by A. J. Woolman in Florida.

PLATE CVIII.

Text page.

288. **Fundulus nottii** (Agassiz) 656
Drawing by H. L. Todd from No. 31439, U.S.N.M., collected in Elbow Creek, Florida, by J. A. Henshall.

289. **Fundulus notatus** (Rafinesque) 659
Drawing by H. L. Todd from No. 36324, U.S.N.M., collected in White River at Eureka Springs, Arkansas, by Jordan and Gilbert.

290. **Adinia dugesii** (Bean) 661
Drawing by H. L. Todd from the type, No. 37831, U.S.N.M., collected by Prof. A. Dugès, in Guanajuato, Mexico.

PLATE CIX.

291. **Fundulus goodei** (Jordan) 664; 2831
Drawing by A. H. Baldwin, from a specimen collected by A. J. Woolman in Florida.

292. **Lucania parva** (Baird and Girard) 665
Drawing by W. S. Haines from a specimen collected by Dr. Bean in New Jersey.

293. **Characodon bilineatus** Bean 668
Drawing by W. S. Haines from the type, No. 37832, U.S.N.M., collected by Professor Dugès in Guanajuato, Mexico.

PLATE CX.

294, 294*a*, 294*b*, 294*c*, 294*d*. **Empetrichthys merriami** Gilbert 667
Drawings from the type, No. 46101, U.S.N.M., collected by Merriam and Bailey in Ash Meadows, Amargosa Desert, on the boundary between California and Nevada.

PLATE CXI.

295, 295*a*. **Characodon variatus** Bean 669
Drawings by H. L. Todd from No. 37810, U.S.N.M., the type of *C. ferrugineus* Bean, collected by Professor Dugès in Guanajuato, Mexico.

296. **Cyprinodon variegatus** Lacépède 671
Drawing by A. H. Baldwin from a male example collected by H. M. Smith at St. George Island, Maryland.

PLATE CXII.

296*a*. **Cyprinodon variegatus** Lacépède 671
Drawing by A. H. Baldwin from a young example collected by H. M. Smith at St. George Island, Maryland.

297. **Cyprinodon carpio** Günther 675
Drawing by H. L. Todd from No. 32151, U.S.N.M., collected by Dr. J. W. Velie at Boca Ciega Bay, Florida.

298. **Jordanella floridæ** Goode and Bean 677
Drawing by A. H. Baldwin from a specimen collected by A. J. Woolman in Florida.

PLATE CXIII.

Text page.

299. **Gambusia affinis** (Baird and Girard) 680
Drawing by A. H. Baldwin from No. 37839, U.S.N.M., a male, collected by Professor Dugès in Mexico.

299*a*. **Gambusia affinis** (Baird and Girard) 680
Drawing by A. H. Baldwin from a female example collected by H. M. Smith at St. George Island, Maryland.

300. **Anableps dovii** Gill 685
Drawing by A. H. Baldwin from No. 48214, U.S.N.M., collected by E. W. Nelson in Tehuantepec, Mexico.

PLATE CXIV.

301. **Goodea atripinnis** Jordan 685
Drawing from the type, No. 23137, U.S.N.M., collected by Professor Dugès at Leon in Guanajuato, Mexico.

302. **Heterandria formosa** Agassiz 687
Drawing by A. H. Baldwin.

303. **Pœcilia presidionis** Jordan and Culver 697
Drawing by Anna L. Brown from the type, a female, No. 2687, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico, in the Rio Presidio.

PLATE CXV.

304. **Xiphophorus helleri** Heckel 701
Drawing by A. H. Baldwin from No. 44948, U.S.N.M., collected by A. L. Herrera at Vera Cruz, Mexico.

305. **Chologaster cornutus** Agassiz 703
Drawing by S. F. Denton from the type of *C. avitus* Jordan and Jenkins, No. 39864, U.S.N.M., collected by Jenkins and Meek in the outlet of the Dismal Swamp, Virginia.

306. **Typhlichthys subterraneus** Girard 704
Drawing by H. L. Todd from No. 36806, U.S.N.M., collected in Mammoth Cave, Kentucky.

307. **Amblyopsis spelæus** DeKay 706
Drawing by H. L. Todd from No. 5863, U.S.N.M., collected in Mammoth Cave, Kentucky.

PLATE CXVI.

308. **Tylosurus raphidoma** (Ranzani) 715
Drawing by H. L. Todd.

309. **Tylosurus acus** (Lacépède) 716
Drawing by H. L. Todd from No. 21422, U.S.N.M., received from E. G. Blackford.

310. **Chriodorus atherinoides** Goode and Bean 719
Drawing by H. L. Todd from the type, No. 26593, U.S.N.M., collected by Silas Stearns at Key West, Florida.

311. **Hyporhamphus unifasciatus** (Ranzani) 720
Drawing by H. L. Todd from No. 16944, U.S.N.M., collected by Otto Lugger in Chesapeake Bay.

PLATE CXVII.

Text page.

312. **Hyporhamphus roberti** (Cuvier and Valenciennes) 721
Drawing by W. S. Haines from a specimen collected at Longport, New Jersey, by Dr. Bean.

313. **Hemirhamphus brasiliensis** (Linnæus) 722
Drawing by H. L. Todd from No. 26400, U.S.N.M., collected at Hungers Wharf, Virginia, by J. T. Wilkins.

314. **Scombresox saurus** (Walbaum) 725
Drawing by H. L. Todd from No. 19853, U.S.N.M., collected by V. N. Edwards at Woods Hole.

315. **Fodiator acutus** (Cuvier and Valenciennes) 728
Drawing by A. H. Baldwin from No. 43427, U.S.N.M., collected by the *Albatross* at Panama.

PLATE CXVIII.

316. **Exonautes exsiliens** (Müller) 732; 2830
Drawing by H. L. Todd from No. 25187, U.S.N.M., collected by E. G. Blackford.

317. **Exonautes rondelettii** (Cuvier and Valenciennes) 733; 2830
Drawing by H. L. Todd from No. 21871, U.S.N.M., collected by Capt. N. McPhee in N. lat. 41° 40′, W. long. 62° 28′.

318. **Exoccœtus volitans** Linnæus 734
Drawing by H. L. Todd from No. 20636, U.S.N.M., collected by V. N. Edwards at Woods Hole.

PLATE CXIX.

319. **Cypsilurus californicus** (Cooper) 740; 2830
Drawing by H. L. Todd from No. 26907, U.S.N.M., collected by Dr. Jordan at Santa Barbara, California.

320. **Gasterosteus aculeatus** Linnæus 747
Drawing by H. L. Todd from No. 20875, U.S.N.M., collected at Woods Hole, Massachusetts, by V. N. Edwards.

321. **Gasterosteus cataphractus** (Pallas) 749
Drawing by H. L. Todd from a specimen collected by Dr. Bean at St. Paul Island, Alaska.

PLATE CXX.

322. **Apeltes quadracus** (Mitchill) 752
Drawing by A. H. Baldwin from No. 13409, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

323. **Aulorhynchus flavidus** Gill 754
Drawing by A. H. Baldwin from No. 21585, U.S.N.M., collected by J. G. Swan in Puget Sound.

324. **Aulostomus maculatus** Valenciennes 754
Drawing by H. L. Todd from No. 34838, U.S.N.M., collected by U. S. Fish Commission, Potomac River, Washington.

Text page.

325. **Siphostoma starksii** Jordan & Culver 771
Drawing by Anna L. Brown from the type, No. 2686, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition in the Rio Presidio, Mazatlan, Mexico.

326. **Corythroichthys cayorum** Evermann and Kendall 2838
Drawing by A. H. Baldwin from the type, No. 48784, U S.N.M., a male, collected by Evermann and Kendall at Key West, Florida.

PLATE CXXI.

327. **Hippocampus hudsonius** De Kay 777
Drawing by H. L. Todd.

328. **Hippocampus zosteræ** Jordan and Gilbert 778
Drawing by W. S. Atkinson from a specimen collected by Dr. Jordan at Pensacola, Florida.

329. **Percopsis guttatus** Agassiz 784
Drawing by A. H. Baldwin from a specimen collected by Dr. Evermann in East Okoboji Lake, Iowa.

PLATE CXXII.

330. **Columbia transmontana** Eigenmann and Eigenmann 784
Drawing by A. H. Baldwin from the type, collected at the mouth of the Umatilla River, Oregon, by Dr. Eigenmann.

331. **Aphredoderus sayanus** (Gilliams) 786
Drawing from No. 34401, U.S.N.M., collected by William McAdams in the Illinois River.

332. **Atherina stipes** Müller and Troschel 790
Drawing by A. H. Baldwin from No. 38456, U.S.N.M., collected by the *Albatross* in the Bahamas.

PLATE CXXIII.

333. **Atherina aræa** Jordan and Gilbert 790
Drawing by W. S. Haines from the type, No. 34967, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

334. **Chirostoma humboldtanum** (Cuvier and Valenciennes) 793
Drawing by A. H. Baldwin from No. 44156, U.S.N.M., collected by Scovell and Woolman in Mexico.

335. **Eslopsarum jordani** (Woolman) 793; 2840
Drawing by A. H. Baldwin from the type, collected by A. J. Woolman in the canals at Salamanca, Mexico.

PLATE CXXIV.

336. **Kirklandia vagrans** (Goode and Bean) 794
Drawing by H. L. Todd from No. 22864, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

Text page.

337. **Menidia peninsulæ** (Goode and Bean) 797
Drawing by H. L. Todd from No. 21481, U.S.N.M., collected at Pensacola, Florida., by Silas Stearns.

338. **Menidia gracilis beryllina** (Cope) 797
Drawing by A. H. Baldwin from a specimen collected by H. M. Smith in the Potomac River.

PLATE CXXV.

339. **Eurystole eriarcha** (Jordan and Gilbert) 803
Drawing by Anna L. Brown from No. 2689, L. S. Jr. Univ. Mus., collected by the Hopkins expedition at Mazatlan, Mexico.

340. **Thyrina evermanni** Jordan and Culver 804
Drawing by Anna L. Brown from the type, No. 2688, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

341. **Atherinopsis californiensis** Girard 806
Drawing from No. 26764, U.S.N.M., collected by Dr. Jordan at San Diego, California.

PLATE CXXVI.

342. **Atherinops affinis** (Ayres) 807
Drawing by Anna L. Brown.

343. **Mugil cephalus** Linnæus 811
Drawing by H. L. Todd from No. 24456, U.S.N.M., collected at Woods Hole, Massachusetts, by V. N. Edwards.

344. **Mugil curema** Cuvier and Valenciennes 813
Drawing by H. L. Todd.

PLATE CXXVII.

345. **Mugil hospes** Jordan and Culver 814
Drawing by Anna L. Brown from the type, No. 2890, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

346. **Chænomugil proboscideus** (Günther) 816
Drawing by A. H. Baldwin from No. 46563, U.S.N.M., collected by the *Albatross* at Clarion Island.

347. **Agonostomus monticola** (Bancroft) 819
Drawing by A. H. Baldwin from No. 45482, U.S.N.M., collected by E. W. Nelson in Mexico.

PLATE CXXVIII.

348. **Joturus pichardi** Poey 821
Drawing by A. H. Baldwin from No. 31010, U.S.N.M., collected by Captain Dow at Panama.

Text page.

349. **Sphyræna barracuda** (Walbaum) 823; 2841
Drawing by H. L. Todd from No. 14978, U.S.N.M., received from E. G. Blackford, collected in Florida.

350. **Polydactylus octonemus** (Girard) 830
Drawing by H. L. Todd from No. 22821, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

PLATE CXXIX.

351. **Ammodytes americanus** De Kay 833
Drawing by H. L. Todd from No. 16500, U.S.N.M., collected by the U. S. Fish Commission at Nantucket.

352. **Bathyclupea argentea** Goode and Bean 835
Drawing by A. H. Baldwin from the type collected by the *Blake*, off Neris.

353. **Stephanoberyx monæ** Gill 836
Drawing by H. L. Todd from the type, No. 33445, U.S.N.M., collected by the *Albatross* at Station 2077, in the Gulf Stream.

PLATE CXXX.

354. **Hoplostethus mediterraneus** Cuvier and Valenciennes 837
Drawing by A. H. Baldwin from No. 43624, U.S.N.M., collected by the *Albatross* at Station 2059.

355. **Plectromus suborbitalis** Gill 841
Drawing by H. L. Todd from the type, No. 33271, U.S.N.M., collected by the *Albatross* at Station 2036, in N. lat. 38° 52′ 40″, W. long. 69° 24′ 40″, in 1,735 fathoms.

356. **Plectromus crassiceps** Günther 843
Drawing by S. F. Denton from No. 33378, U.S.N.M., collected by the *Albatross* in N. lat. 41° 40′ 30″, W. long. 65° 35′, in 855 fathoms.

PLATE CXXXI.

357. **Beryx splendens** Lowe 844
Drawing by M. M. Smith from a specimen collected by the *Albatross* at Station 2415, in N. lat. 30° 44′, W. long. 79° 26′, in 440 fathoms.

358. **Holocentrus ascensionis** (Osbeck) 848
Drawing by H. L. Todd.

359. **Flammeo marianus** (Cuvier and Valenciennes) 852; 2871
Drawing by W. S. Atkinson from specimen No. 4972, L. S. Jr. Univ. Mus., collected by Rev. J. S. Roberts at Kingston, Jamaica.

PLATE CXXXII.

360. **Mullus auratus** Jordan and Gilbert 856
Drawing by A. H. Baldwin.

361. **Mulloides rathbuni** (Evermann and Jenkins) 857
Drawing by A. H. Baldwin from the type, No. 43241, U.S.N.M., collected by Evermann and Jenkins at Guaymas, Mexico.

Text page

362. **Upeneus maculatus** (Bloch) 858
Drawing by H. L. Todd from No. 21910, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

PLATE CXXXIII.

363. **Scomber scombrus** Linnæus 865
Drawing by H. L. Todd from No. 25256, U.S.N.M., obtained in the Washington market.

364. **Scomber colias** Gmelin 866
Drawing by H. L. Todd from No. 23480, U.S.N.M., collected by the U. S. Fish Commission at Provincetown, Massachusetts.

365. **Auxis thazard** (Lacépède) 867
Drawing by H. L. Todd from No. 35136, U.S.N.M., collected by the U. S. Fish Commission at Woods Hole, Massachusetts.

PLATE CXXXIV.

366. **Gymnosarda alleterata** (Rafinesque) 869
Drawing by H. L. Todd from No. 10436, U.S.N.M., collected by S. F. Baird at Woods Hole, Massachusetts.

367. **Germo alalunga** (Gmelin) 871
Drawing by H. L. Todd from No. 21844, U.S.N.M., collected by Capt. William Thompson of the schooner *Magic*, in 300 fathoms.

368. **Scomberomorus maculatus** (Mitchill) 874
Drawing by H. L. Todd from No. 15582, U.S.N.M., obtained by E. G. Blackford in the New York market.

PLATE CXXXV.

369. **Scomberomorus regalis** (Bloch) 875
Drawing by H. L. Todd from No. 12527, U.S.N.M., collected by E. G. Blackford at Key West.

370. **Escolar violaceus** (Bean) 878; 2843
Drawing by S. F. Denton from the type, No. 39287, U.S.N.M., collected by Capt. Thomas Thompson on Le Have Bank in 125 fathoms.

371. **Epinnula magistralis** Poey 880
Drawing by H. L. Todd from No. 37238, U.S.N.M., collected by the *Albatross* in the Caribbean Sea.

PLATE CXXXVI.

372. **Evoxymetopon tæniatus** Poey 886
Drawing by H. L. Todd from No. 5735, U.S.N.M., collected by Professor Poey in Cuba.

373. **Lepidopus caudatus** (Euphrasen) 886
Drawing by A. H. Baldwin from No. 10115, U.S.N.M., collected by John Xantus at Cape San Lucas, Lower California.

Text page.

374. **Benthodesmus atlanticus** Goode and Bean 887
Drawing by H. L. Todd from the type, No. 29116, U.S.N.M., taken from the stomach of a halibut by Capt. R. Morrison, of the schooner *Laura Nelson*, on the west edge of the Grand Bank of Newfoundland, in 80 fathoms.

PLATE CXXXVII.

375. **Trichiurus lepturus** Linnæus 889
Drawing by H. L. Todd from No. 18028, U.S.N.M., collected by Dr. Janeway at St. Augustine, Florida.

376. **Istiophorus nigricans** (Lacépède) 891
Drawing by H. L. Todd from No. 37923, U.S.N.M., collected by U. S. Fish Commission at Woods Hole, Massachusetts.

PLATE CXXXVIII.

377. **Nematistius pectoralis** Gill 895
Drawing by A. H. Baldwin.

378. **Oligoplites saurus** (Bloch and Schneider) 898
Drawing by H. L. Todd from No. 16354, U.S.N.M., collected by the U. S. Fish Commission at Memensha Bight.

PLATE CXXXIX.

379. **Naucrates ductor** Linnæus 900
Drawing by H. L. Todd from No. 23197, U.S.N.M., collected by William A. Bansett at New Bedford, Massachusetts.

380. **Seriola dorsalis** (Gill) 902
Drawing by H. L. Todd from a specimen collected by Jordan and Gilbert at San Pedro, California.

381. **Seriola zonata** (Mitchill) 902
Drawing by H. L. Todd from No. 18720, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

PLATE CXL.

382. **Seriola lalandi** Cuvier and Valenciennes 903
Drawing by H. L. Todd from No. 37918, U.S.N.M., collected by the U. S. Fish Commission at Woods Hole, Massachusetts.

383. **Decapterus macarellus** (Cuvier and Valenciennes) 909
Drawing by H. L. Todd.

384. **Trachurus trachurus** (Linnæus) 910
Drawing by H. L. Todd from No. 23421, U.S.N.M., collected at Newport, Rhode Island.

PLATE CXLI.

385. **Trachurops crumenophthalmus** (Bloch) 911
Drawing by H. L. Todd from No. 20681, U.S.N.M., collected by V. N. Edwards, at Woods Hole, Massachusetts.

Text page.

386. **Hemicaranx amblyrhynchus** (Cuvier and Valenciennes)..... 912
Drawing by H. L. Todd from No. 30177, U.S.N.M., collected by Silas Stearns, at Pensacola, Florida.

387. **Caranx hippos** (Linnæus)..... 920
Drawing by H. L. Todd from No. 10431, U.S.N.M., collected by V. N. Edwards, at Woods Hole, Massachusetts.

PLATE CXLII.

388. **Caranx latus** Agassiz..... 921
Drawing by H. L. Todd from No. 20247, U.S.N.M., collected by V. N. Edwards, at Woods Hole, Massachusetts.

389. **Caranx crysos** (Mitchill)..... 923
Drawing by H. L. Todd from No. 16512, U.S.N.M., collected by the U.S. Fish Commission at Woods Hole, Massachusetts.

PLATE CXLIII.

390. **Caranx medusicola** Jordan and Starks..... 924
Drawing by Anna L. Brown from the type, No. 2645, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

391. **Hynnis hopkinsi** Jordan and Starks..... 933
Drawing by Anna L. Brown from the type, No. 1563, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

PLATE CXLIV.

392. **Vomer setipinnis** (Mitchill)..... 934
Drawing by H. L. Todd from No. 16252, U.S.N.M, obtained by E. G. Blackford in the Fulton Market, New York.

393. **Selene vomer** (Linnæus)..... 936
Drawing by H. L. Todd from No. 22007, U.S.N.M., a young example, collected by C. J. Copley at Stapleton, Staten Island.

PLATE CXLV.

393*a*. **Selene vomer** (Linnæus)..... 936
Drawing by H. L. Todd from No. 22279, U.S.N.M., an adult.

394. **Chloroscombrus chrysurus** (Linnæus)..... 938
Drawing by H. L. Todd from No. 21286, U.S.N.M., collected by Dr. Goode in the St. Johns River, Florida.

PLATE CXLVI.

395. **Trachinotus glaucus** (Bloch)..... 940
Drawing by H. L. Todd from No. 30176, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

396. **Trachinotus falcatus** (Linnæus)..... 941
Drawing by H. L. Todd from No. 26585, U.S.N.M., collected by Silas Stearns in Florida.

PLATE CXLVII.

Text page.

397. **Trachinotus culveri** Jordan and Starks 942
Drawing by Anna L. Brown from the type, No. 2691, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

398. **Trachinotus carolinus** (Linnæus) 944
Drawing by H. L. Todd from No. 10427, U.S.N.M., collected by S. F. Baird at Woods Hole, Massachusetts.

PLATE CXLVIII.

399. **Zalocys stilbe** Jordan and McGregor 2848
Drawing by Anna L. Brown from the type, No. 11996, L. S. Jr. Univ. Mus., collected by R. C. McGregor, at Clarion Island.

400. **Pomatomus saltatrix** (Linnæus) 946
Drawing by H. L. Todd, from a cast.

401. **Rachycentron canadus** (Linnæus) 948
Drawing by H. L. Todd from No. 18563, U.S.N.M.

PLATE CXLIX.

402. **Coryphæna hippurus** Linnæus 952
Drawing by H. L. Todd from No. 16482, U.S.N.M., obtained by E. G. Blackford in Fulton Market.

403. **Centrolophus niger** (Gmelin) 963
Drawing by S. F. Denton from a specimen obtained at Dennis, Massachusetts.

PLATE CL.

404. **Peprilus paru** (Linnæus) 965
Drawing by H. L. Todd from No. 15234, U.S.N.M.

405. **Poronotus triacanthus** (Peck) 967
Drawing by H. L. Todd from No. 787, U.S.N.M., collected by S. F. Baird at Beesleys Point, New Jersey.

PLATE CLI.

406. **Icichthys lockingtoni** Jordan and Gilbert 969
Drawing by A. H. Baldwin from No. 27397, U.S.N.M., collected at Point Reyes, California.

407. **Schedophilus medosophagus** Cocco 970
Drawing from H. L. Todd from a specimen collected by the *Albatross* in lat. 27° 49′ N., 76° 12′ W.

408. **Acrotus willoughbyi** Bean 973
Drawing by H. L. Todd from the type, No. 39340, U.S.N.M., collected by Chas. Willoughby at the Quinault Agency, west coast of Washington.

PLATE CLII.

Text page.

409. **Zaprora silenus** Jordan 2850
Drawing by Anna L. Brown from the type, in the Provincial Museum at Victoria, British Columbia, collected by H. T. Stainton, at Nanaimo, Vancouver Island.

410. **Grammicolepis brachiusculus** Poey 974
Drawing by A. H. Baldwin from a drawing by R. W. Shufeldt, Jour. Morph., Vol. II.

411. **Tetragonurus cuvieri** Risso 976
Drawing by Mary Hildebrandt from a specimen collected by V. N. Edwards at Woods Hole.

PLATE CLIII.

412. **Pempheris mulleri** Poey 978
Drawing by M. M. Smith from No. 37111, U.S.N.M., collected by the *Albatross* at Cozumel.

413. **Pempheris poeyi** Bean 979
Drawing by M. M. Smith from the type, No. 37184, U.S.N.M., collected by Prof. Poey in Cuba.

414. **Elassoma evergladei** Jordan 982
Drawing by A. H. Baldwin from a specimen collected by A. J. Woolman in Florida.

PLATE CLIV.

415. **Pomoxis annularis** Rafinesque 987
Drawing by H. L. Todd from No. 10387, U.S.N.M.

416. **Pomoxis sparoides** (Lacépède) 987
Drawing by H. L. Todd from No. 10077, U.S.N.M.

PLATE CLV.

417. **Centrarchus macropterus** (Lacépède) 988
Drawing by H. L. Todd from No. 20397, U.S.N.M., collected by W. S. Hyatt at Kingston, North Carolina.

418. **Acantharchus pomotis** (Baird) 989
Drawing by H. L. Todd from No. 6475, U.S.N.M., collected at Tarboro, North Carolina.

PLATE CLVI.

419. **Ambloplites rupestris** (Rafinesque) 990
Drawing by H. L. Todd from No. 9401, U.S.N.M., collected by George Clark at Ecorse, Michigan.

419, A, B, C. **Skull of Ambloplites rupestris** (Rafinesque) 990
Drawings from Boulenger's Catalogue of Perciform Fishes, Vol. I, p. 3.

PLATE CLVII.

Text page.

420. **Archoplites interruptus** (Girard) 991
Drawing by H. L. Todd from No. 27137, U.S.N.M., collected by Dr. Jordan at San Francisco.

421. **Chænobryttus gulosus** (Cuvier and Valenciennes) 992
Drawing by H. L. Todd from No. 17803, U.S.N.M., collected by Kumlien and Bean in Jackson Lake, near Montgomery, Alabama.

PLATE CLVIII.

422. **Enneacanthus gloriosus** (Holbrook) 993
Drawing by H. L. Todd from No. 20356, U.S.N.M., collected by C. C. Abbott at Trenton, New Jersey.

423. **Mesogonistius chætodon** (Baird) 995
Drawing from No. 20354, U.S.N.M., collected by C. C. Abbott at Trenton, New Jersey.

PLATE CLIX.

424. **Apomotis symmetricus** (Forbes) 998
Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Kilpers Pond, Houston, Texas.

425. **Lepomis auritus** (Linnæus) 1001
Drawing by H. L. Todd.

425*a*. **Skull of Lepomis auritus** (Linnæus) 1001
Drawing from Boulenger's Catalogue of Perciform Fishes, Vol. I, p. 24.

PLATE CLX.

426. **Lepomis megalotis** (Rafinesque) 1002
Drawing by H. L. Todd from No. 36465, U.S.N.M., collected by Jordan and Gilbert in Saline River, Benton, Arkansas.

427. **Lepomis pallidus** (Mitchill) 1005
Drawing by H. L. Todd from No. 8448, U.S.N.M.

PLATE CLXI.

428. **Eupomotis euryorus** (McKay) 1008
Drawing by H. L. Todd from the type No. 4109, U.S.N.M., collected in Lake Huron, at Fort Gratiot, Michigan.

429. **Eupomotis gibbosus** (Linnæus) 1009
Drawing by H. L. Todd from No. 4163, U.S.N.M., collected by Professor Baird in Root River, Wisconsin.

PLATE CLXII.

430. **Micropterus dolomieu** Lacépède 1011
Drawing by H. L. Todd from No. 14143, U.S.N.M., obtained in the Washington market.

430*a*. **Vertebræ of Micropterus dolomieu** Lacépède 1011
From Boulenger's Catalogue Perciform Fishes. Vol. I, p. 4.

PLATE CLXIII.

Text page.

431. **Micropterus salmoides** (Lacépède) 1012
Drawing by H. L. Todd.

432. **Kuhlia rupestris** (Lacépède) .....
Drawings from Boulenger's Catalogue of Perciform Fishes, Vol. 1, fig. 4, p. 35.

PLATE CLXIV.

433. **Stizostedion vitreum** (Mitchill) 1021
Drawing by H. L. Todd from No. 10072, U.S.N.M., collected by J. W. Milner at Rochester, New York.

433*a*. **Tail of Stizostedion vitreum** (Mitchill) 1021
Drawing by Anna L. Brown.

434. **Stizostedion canadense** (Smith) 1022
Drawing by H. L. Todd from No. 10555, U.S.N.M., collected by J. W. Milner at Ecorse, Michigan.

PLATE CLXV.

435. **Perca flavescens** (Mitchill) 1023
Drawing by H. L. Todd.

436. **Percina caprodes** (Rafinesque) 1026
Drawing by H. L. Todd from No. 34744, U.S.N.M., collected by H. G. Dresel in Licking County reservoir, Ohio.

436*a*. **Skull of Percina caprodes** (Rafinesque) 1026
Drawing from Boulenger's Catalogue of Perciform Fishes, Vol. 1, fig. 7, p. 57.

PLATE CLXVI.

437. **Hadropterus macrocephalus** (Cope) 1031
Drawing by A. H. Baldwin from a specimen collected by Dr. Gurley in Indian Creek, near Cumberland Gap, Tennessee.

438. **Hadropterus aspro** (Cope and Jordan) 1032
Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Chickamauga Creek, at Lee and Gordon's mill, Georgia.

PLATE CLXVII.

439. **Hadropterus gruntheri** Eigenmann and Eigenmann 1033
Drawing by A. H. Baldwin from a specimen collected by A. J. Woolman in the Red River of the North, Moorehead, Minnesota.

440. **Hadropterus evides** (Jordan and Copeland) 1036
Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Clinch River, at Walkers Ford, Tennessee.

441. **Hadropterus scierus** Swain 1037
Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Clinch River, at Walkers Ford, Tennessee.

PLATE CLXVIII.

Text page.

442. **Hypohomus aurantiacus** (Cope) 1040
Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Clinch River, at Walkers Ford, Tennessee.

443. **Hypohomus spilotus** (Gilbert) 1043
Drawing by A. H. Baldwin.

444. **Cottogaster shumardi** (Girard) 1046
Drawing by H. L. Todd from No. 17852, U.S.N.M., collected by Dr. Jordan in the Wabash River, Indiana.

PLATE CLXIX.

445. **Cottogaster cheneyi** Evermann and Kendall 2851
Drawing by A. H. Baldwin from the type No. 48781, U.S.N.M., collected by Evermann and Bean in Racket River, Norfolk, New York.

446. **Ulocentra gilberti** Evermann and Thoburn 1049
Drawing by A. H. Baldwin from the type No. 47531, U.S.N.M., collected by Evermann, Scovell, and Gurley in Clinch River, Walkers Ford, Tennessee.

447. **Ulocentra meadiæ** Jordan and Evermann 2852
Drawing by A. H. Baldwin from the type No. 48903, U.S.N.M., collected by Dr. Gurley in Indian Creek, Cumberland Gap, Tennessee.

PLATE CLXX.

448. **Ulocentra simotera** (Cope) 1051
Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Arnwine Spring, Mount Verd, Tennessee.

449. **Diplesion blennioides** (Rafinesque) 1053
Drawing by A. H. Baldwin from a specimen collected by Evermann, Scovell, and Gurley in Clinch River, at Walkers Ford, Tennessee.

450. **Boleosoma nigrum** (Rafinesque) 1056
Drawing by A. H. Baldwin from a specimen collected by R. R. Gurley in Ball Creek, near Tazewell, Tennessee.

PLATE CLXXI.

451. **Boleosoma nigrum** olmstedi (Storer) 1057
Drawing by H. L. Todd from No. 30243, U.S.N.M., collected by Col. Marshall McDonald in the Potomac River, Gunston, Virginia.

452. **Boleosoma camurum** Forbes 1060
Drawing by H. L. Todd from the type No. 23455, U.S.N.M., collected by Dr. Jordan in the Illinois River.

453. **Crystallaria asprella** (Jordan) 1061
Drawing by A. H. Baldwin from No. 45455, U.S.N.M., collected by Dr. Evermann in the Wabash River, New Harmony, Indiana.

PLATE CLXXII.

Text page.

454. **Ammocrypta pellucida clara** (Jordan and Meek) 1063
Drawing by S. F. Denton from the type No. 35828, U.S.N.M., collected by Jordan and Meek in the Des Moines River, Ottumwa, Iowa.

455. **Ammocrypta beanii** Jordan 1064
Drawing by A. H. Baldwin from No. 17833, U. S. N.M., collected by Bean and Maxson in Notalbany River, Louisiana.

456. **Etheostoma camurum** (Cope) 1076
Drawing by A. H. Baldwin from a specimen collected by R. R. Gurley in Indian Creek, near Cumberland Gap, Tennessee.

PLATE CLXXIII.

457. **Etheostoma cinereum** Storer 1078
Drawing by A. H. Baldwin from a specimen collected by P. H. Kirsch in Wolf River, Byrdstown, Tennessee.

458. **Etheostoma jordani** Gilbert 1079
Drawing by S. F. Denton.

459. **Etheostoma pottsii** (Girard) 1082
Drawing by H. L. Todd from No. 38245, U.S.N.M., the type of *Etheostoma micropterus* Gilbert, collected by E. Wilkinson in Chihuahua, Mexico.

PLATE CLXXIV

460. **Etheostoma iowæ** Jordan and Meek 1083
Drawing by A. H. Baldwin from a specimen collected by A. J. Woolman in Pomme de Terre River, Appleton, Wisconsin.

461. **Etheostoma jessiæ** (Jordan and Brayton) 1084
Drawing by H. L. Todd from No. 27896, U.S.N.M., collected by Dr. Forbes, in Lake Peoria, Illinois.

462. **Etheostoma lepidogenys** Evermann and Kendall 1087
Drawing by A. H. Baldwin from the type, No. 44840, U.S.N.M., collected by Evermann, Scovell, and Gurley, in Comal Spring, New Braunfels, Texas.

PLATE CLXXV.

463. **Etheostoma obeyense** Kirsch 1092
Drawing by A. H. Baldwin from the type, No. 45565, U.S.N.M., collected by Dr. Kirsch, in tributary of Obeys River, Clinton County, Kentucky.

464. **Etheostoma pagei** Meek 1092
Drawing by A. H. Baldwin from the type, No. 45556, U.S.N.M., collected by Dr. Meek in Spring Branch at Neosho, Missouri.

465. **Etheostoma virgatum** (Jordan) 1093
Drawing by A. H. Baldwin from No. 36644, U.S.N.M., collected by Gilbert and Swain in Rock Castle River, Livingston, Kentucky.

PLATE CLXXVI.

Text page.

466. **Etheostoma juliæ** Meek 1093
Drawing by S. F. Denton from the type collected by Meek, Drew, and Rettger in James River, near Springfield, Missouri.

467. **Psychromaster tuscumbia** (Gilbert and Swain) 1100
Drawing by A. H. Baldwin from the type, No. 36154, U.S.N.M., collected by Gilbert and Swain in Spring Creek, Tuscumbia, Alabama.

468. **Copelandellus quiescens** (Jordan) 1100
Drawing by A. H. Baldwin.

PLATE CLXXVII.

469. **Boleichthys fusiformis** (Girard) 1101
Drawing by H. L. Todd from No. 36415, U.S.N.M., collected by Jordan and Gilbert in Washita River, Arkadelphia, Arkansas.

470. **Microperca fonticola** (Jordan and Gilbert) 1104
Drawing by Ernest Copeland from the type, No. 36523, U.S.N.M., collected by Jordan and Gilbert in San Marcos River, San Marcos, Texas.

471. **Apogon retrosella** (Gill) 1108
Drawing by Anna L. Brown from No. 2917. L. S. Jr. Univ. Mus., collected by the Hopkins expedition at Mazatlan, Mexico.

PLATE CLXXVIII.

472. **Apogon pigmentarius** (Poey) 1109

473. **Apogonichthys alutus** (Jordan & Gilbert) 1110
Drawing by A. H. Baldwin from No. 30874, U.S.N.M., collected by Jordan and Stearns at Pensacola, Florida.

PLATE CLXXIX.

474. **Cheilodipterus affinis** Poey 1113
Drawing by A. H. Baldwin from No. 37416, U.S.N.M., collected by Professor Poey in Cuba.

475. **Hypoclydonia bella** Goode and Bean 1115
Drawing by S. F. Denton from No. 39338, U.S.N.M., collected by the *Albatross* at Station 2426, in N. lat. 36° 01′ 30″, W. long. 74° 47′ 30″, in 93 fathoms.

476. **Centropomus undecimalis** (Bloch) 1118
Drawing by H. L. Todd from No. 19907, U.S.N.M.

PLATE CLXXX.

477. **Roccus chrysops** (Rafinesque) 1132
Drawing by H. L. Todd from No. 10326, U.S.N.M., collected by J. W. Milner at Sandusky, Ohio.

478. **Roccus lineatus** (Bloch) 1132
Drawing by H. L. Todd from No. 25219, U.S.N.M., obtained by Professor Baird in the Washington market.

PLATE CLXXXI.

Text page.

479. **Morore americana** (Gmelin) 1134
Drawing by H. L. Todd from No. 15861, U.S.N.M., received from the New York market.

480, 480*a*. **Polyprion americanus** (Bloch & Schneider) 1139
Drawings from Boulenger's Catalogue of Perciform Fishes Vol. I, fig. 12, p. 149.

PLATE CLXXXII.

481. **Bodianus fulvus punctatus** (Linnæus) 1146
Drawing by A. H. Baldwin from No. 33717, U.S.N.M., collected by J. C. Brevoort in the West Indies.

482. **Epinephelus adscensionis** (Osbeck) 1152
Drawing by H. L. Todd from No. 26574, U.S.N.M., collected by Silas Stearns, at Key West, Florida.

PLATE CLXXXIII.

483. **Epinephelus striatus** (Bloch) 1157
Drawing by H. L. Todd from No. 31910, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

484. **Epinephelus drummond-hayi** Goode and Bean 1159
Drawing by H. L. Todd from No. 31719, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

PLATE CLXXXIV.

485. **Epinephelus morio** (Cuvier and Valenciennes) 1160
Drawing by H. L. Todd from No. 22129, U.S.N.M., collected in Florida and obtained in the Washington market by Dr. Goode.

486. **Garrupa nigrita** (Holbrook) 1161
Drawing by H. L. Todd from No. 37207, U.S.N.M., collected by the *Albatross*.

PLATE CLXXXV.

487. **Promicrops itaiara** (Lichtenstein) 1162
Drawing by H. L. Todd from No. 22306, U.S.N.M., collected at mouth of St. Johns River, Florida.

487*a*, 487*b*. **Promicrops itaiara** (Lichtenstein) 1162
Drawings from Boulenger's Catalogue of Perciform Fishes, Vol. I, fig. 13, p. 164.

PLATE CLXXXVI.

488. **Alphestes chloropterus** (Cuvier and Valenciennes) 1164
Drawing by A. H. Baldwin from No. 9821, U.S.N.M., collected by Professor Poey in Cuba.

488*a*. **Alphestes chloropterus** (Cuvier and Valenciennes) 1164
Drawing from Boulenger's Catalogue of Perciform Fishes, Vol. I, fig. 18, p. 254.

Text page.

489. **Dermatolepis zanclus** Evermann and Kendall 2854
Drawing by A. H. Baldwin from the type, No. 48843, U.S.N.M., collected by Evermann and Kendall at Key West, Florida.

PLATE CLXXXVII.

490. **Mycteroperca boulengeri** Jordan and Starks 1171
Drawing by Anna L. Brown from the type, No. 1691, L. S. Jr. Univ. Mus., collected by the Hopkins expedition to Mazatlan, Mexico.

491. **Mycteroperca venenosa** (Linnæus) 1172
Drawing by H. L. Todd from No. 35103, U.S.N.M., collected by Dr. Jordan at Havana, Cuba.

492. **Skull of Mycteroperca bonaci** (Poey) 1174
Drawing from Boulenger's Catalogue of Perciform Fishes, Vol. I, fig. 19, p. 258.

PLATE CLXXXVIII.

493. **Mycteroperca jordani** (Jenkins and Evermann) 1176
Drawing by A. H. Baldwin from the type, No. 39628, U.S.N.M., collected at Guaymas, Mexico, by Jenkins and Evermann.

494. **Mycteroperca microlepis** (Goode and Bean) 1177
Drawing by H. L. Todd from No. 26587, U.S.N.M., collected by Silas Stearns at Key West, Florida.

495. **Mycteroperca falcata phenax** Jordan and Swain 1185
Drawing by H. L. Todd from No. 34992, U.S.N.M., collected at Key West, Florida, by Dr. Jordan.

PLATE CLXXXIX.

496. **Hypoplectrus unicolor nigricans** (Poey) 1193
Drawing by H. L. Todd from No. 3423, U.S.N.M., collected at Garden Key, Florida.

497. **Hypoplectrus gemma** Goode and Bean 1193
Drawing by H. L. Todd from the type, No. 3422, U.S.N.M., collected at Garden Key, Florida.

PLATE CXC.

498. **Paralabrax maculatofasciatus** (Steindachner) 1196
Drawing by A. H. Baldwin from No. 34754, U.S.N.M., collected by Rosa Smith at San Diego, California.

499. **Skull of Paralabrax humeralis** (Cuvier and Valenciennes) ... 1196
Drawing from Boulenger's Catalogue of Perciform Fishes, Vol. I, fig. 20, p. 275.

500. **Centropristes striatus** (Linnæus) 1199
Drawing by H. L. Todd from No. 14838, U.S.N.M., collected by the U. S. Fish Commission at Noank, Connecticut.

PLATE CXCI.

Text page.

501. **Centropristes philadelphicus** (Linnæus) 1201
Drawing by A. H. Baldwin from No. 33161, U.S.N.M., collected by Dr. Gilbert at Charleston, South Carolina.

502. **Diplectrum formosum** (Linnæus) 1207
Drawing by H. L. Todd from No. 21543, U.S.N.M., collected by C. C. Leslie at Charleston, South Carolina.

503. **Prionodes bulleri** (Boulenger) 1213
Drawing from Boulenger's Catalogue of Perciform Fishes, Vol. I, pl. X.

PLATE CXCII.

504. **Paranthias furcifer** (Cuvier and Valenciennes) 1221
Drawing by A. H. Baldwin from No. 12540, U.S.N.M., collected by Professor Poey in Cuba.

505. **Hemianthias vivanus** (Jordan and Swain) 1223
Drawing by W. S. Atkinson from specimen No. 1655, L. S. Jr. Univ. Mus., collected by Dr. Jordan at Pensacola, Florida.

506. **Pronotogrammus multifasciatus** Gill 1226
Drawing by H. L. Todd from the type, No. 2762, U.S.N.M., collected by John Xantus at Cape San Lucas, Lower California.

PLATE CXCIII.

507. **Anthias asperilinguis** Günther 1227
Drawing from Boulenger's Catalogue of Perciform Fishes, Vol. I, pl. XIII.

508. **Gramma loreto** Poey 1229
Drawing by J. W. Folsom from the type, No. 10031, M.C.Z., collected by Professor Poey at Matanzas, Cuba.

PLATE CXCIV.

509. **Rypticus bistrispinus** (Mitchill) 1233
Drawing by H. L. Todd.

510. **Lobotes surinamensis** (Bloch) 1235
Drawing by H. L. Todd.

PLATE CXCV.

511. **Priacanthus arenatus** Cuvier and Valenciennes 1237
Drawing by H. L. Todd from No. 20680, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

512. **Pseudopriacanthus altus** Gill 1239
Drawing by H. L. Todd from No. 2317, U.S.N.M., collected by the *Albatross* off Key West, Florida.

PLATE CXCVI.

Text page.

513. **Hoplopagrus guntheri** Gill 1244
Drawing by A. H. Baldwin from No. 28367, U.S.N.M., collected by Dr. Gilbert at Mazatlan, Mexico.

514. **Evoplites viridis** (Valenciennes) 1246
Drawing by W. S. Atkinson from a specimen collected by Alfonce Forrer at Tres Marias Islands, Mexico.

PLATE CXCVII.

515. **Neomænis apodus** (Walbaum) 1258
Drawing by H. L. Todd from No. 33220, U.S.N.M., collected by Dr. Henshall at Indian River Inlet, Florida.

516. **Neomænus aya** (Bloch) 1264
Drawing by A. H. Baldwin from a specimen obtained in the Washington Market.

PLATE CXCVIII.

517. **Neomænis analis** (Cuvier and Valenciennes) 1265
Drawing by H. L. Todd from No. 35030, U.S.N.M.

518. **Neomænis synagris** (Linnæus) 1266
Drawing by H. L. Todd from No. 36922, U.S.N.M., collected by the U. S. Fish Commission at Key West, Florida.

PLATE CXCIX.

519. **Rabirubia inermis** (Peters 1274
Drawing by Anna L. Brown from No. 4983, L. S. Jr. Univ. Mus., collected by the *Albatross* at Panama.

520. **Ocyurus chrysurus** (Bloch) 1275
Drawing by S. F. Denton from No. 26583, U.S.N.M., collected by Silas Stearns at Key West, Florida.

PLATE CC.

521. **Rhomboplites aurorubens** (Cuvier and Valenciennes) 1277
Drawing by H. L. Todd from No. 21338, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

522. **Apsilus dentatus** Guichenot 1278
Drawing by A. H. Baldwin from No. 9809, U.S.N.M., collected by Professor Poey in Cuba.

PLATE CCI.

523. **Aprion macrophthalmus** (Müller and Troschel) 1280
Drawing by M. M. Smith from a specimen collected by the *Blake* in N. lat. 23° 13′, W. long. 89° 10′, in 84 fathoms.

524. **Etelis oculatus** (Cuvier and Valenciennes) 1282
Drawing by A. H. Baldwin from No. 35049, U.S.N.M., collected by Dr. Jordan at Havana, Cuba.

PLATE CCII.

Text page.

525. **Verilus sordidus** Poey 1284
Drawing by A. H. Baldwin from No. 12565, U.S.N.M., collected by Professor Poey in Cuba.

526. **Xenocys jessiæ** Jordan and Bollman 1285
Drawing by A. H. Baldwin from the type, No. 41166, U.S.N.M., collected by the *Albatross* at Charles Island, Galapagos Group.

PLATE CCIII.

527. **Xenichthys agassizii** Steindachner 1287
Drawing by A. H. Baldwin from No. 26671, U.S.N.M., collected in the Galapagos Islands.

528. **Hæmulon album** Cuvier and Valenciennes 1295
Drawing by H. L. Todd from No. 35035, U.S.N.M., collected at Key West, Florida, by Dr. Jordan.

PLATE CCIV.

529. **Hæmulon macrostomum** Günther 1296
Drawing by H. L. Todd from No. 30057, U.S.N.M., received from the Kingston Public Museum, Jamaica.

530. **Hæmulon parra** (Desmarest) 1297
Drawing by H. L. Todd.

PLATE CCV.

531. **Hæmulon sciurus** (Shaw) 1303
Drawing by H. L. Todd from No. 32603, U.S.N.M., collected at Key West, Florida, by J. A. Henshall.

532. **Hæmulon plumieri** (Lacépède) 1304
Drawing by H. L. Todd from No. 20980, U.S.N.M., collected by Dr. Goode at Charleston, South Carolina.

PLATE CCVI.

533. **Brachygenys chrysargyreus** (Günther) 1307
Drawing by H. L. Todd from No. 35150, U.S.N.M., collected at Havana, Cuba, by Dr. Jordan.

534. **Bathystoma rimator** (Jordan and Swain) 1308
Drawing by H. L. Todd from No. 34957, U.S.N.M., collected by the *Albatross* at St. Thomas, West Indies.

PLATE CCVII.

535. **Bathystoma aurolineatum** (Cuvier and Valenciennes) 1310
Drawing by H. L. Todd from No. 26567, U.S.N.M., collected by Silas Stearns at Key West, Florida.

536. **Lythrulon opalescens** Jordan and Starks 1312
Drawing by Anna L. Brown from the type, No. 2963, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

PLATE CCVIII.

Text page.

537. **Anisotremus surinamensis** (Bloch) 1318
Drawing by A. H. Baldwin from a specimen collected by Evermann and Bean in Indian River at Fort Pierce, Florida.

538. **Anisotremus bilineatus** (Cuvier and Valenciennes) 1319
Drawing by H. L. Todd from No. 30878, U.S.N.M., collected by Dr. J. A. Henshall in Indian River Inlet, Florida.

PLATE CCIX.

539. **Anisotremus virginicus** (Linnæus) 1322
Drawing by H. L. Todd from No. 33189, U.S.N.M., collected by Dr. J. A. Henshall at Key West, Florida.

540. **Orthopristis reddingi** Jordan and Richardson 1336
Drawing by Anna L. Brown from the type, No. 3458, L. S. Jr. Univ. Mus., collected by J. A. Richardson in La Paz Harbor, Lower California.

PLATE CCX.

541. **Orthopristis chrysopterus** (Linnæus) 1338
Drawing by H. L. Todd from No. 3113, U.S.N.M., collected at Pensacola, Florida.

542. **Microlepidotus inornatus** Gill 1341
Drawing by A. H. Baldwin, from No. 43267, U.S.N.M., collected by Evermann and Jenkins at Guaymas, Mexico.

PLATE CCXI.

543. **Otrynter caprinus** (Bean) 1345
Drawing by H. L. Todd from No. 32683, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

544. **Stenotomus chrysops** (Linnæus) 1346
Drawing by H. L. Todd from No. 10425, U.S.N.M., collected by Professor Baird at Woods Hole, Massachusetts.

PLATE CCXII.

545. **Stenotomus aculeatus** (Cuvier and Valenciennes) 1346
Drawing by H. L. Todd from No. 24694, U.S.N.M., collected by R. E. Earll near Charleston, South Carolina.

546. **Calamus calamus** (Cuvier and Valenciennes) 1349
Drawing by H. L. Todd from No. 35040, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

PLATE CCXIII.

547. **Calamus proridens** Jordan and Gilbert 1350
Drawing by H. L. Todd from No. 35056, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

548 **Calamus bajonado** (Bloch and Schneider) 1352
Drawing by H. L. Todd from No. 35042, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

PLATE CCXIV.

Text page.

549. **Calamus penna** (Cuvier and Valenciennes) 1354
Drawing by H. L. Todd from No. 6134, U.S.N.M., collected in Charlotte Harbor, Florida.

550. **Calamus arctifrons** Goode and Bean..... 1355
Drawing by H. L. Todd from the type, No. 30163, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

PLATE CCXV.

551. **Pagrus pagrus** (Linnæus)..... 1356
Drawing by H. L. Todd from a specimen collected by Silas Stearns at Pensacola, Florida.

552. **Lagodon rhomboides** (Linnæus) 1358
Drawing by H. L. Todd from No. 21280, U.S.N.M., collected by Dr. Goode in St. Johns River, Florida.

PLATE CCXVI.

553. **Archosargus unimaculatus** (Bloch) 1359
Drawing by H. L. Todd from No. 35031, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

554. **Archosargus probatocephalus** (Walbaum)..... 1361
Drawing by H. L. Todd from No. 19647, U.S.N.M., collected by Dr. H. C. Yarrow at Beaufort, North Carolina.

PLATE CCXVII.

555. **Diplodus holbrookii** (Bean) 1362
Drawing by H. L. Todd from No. 32632, U.S.N.M., collected at Pensacola, Florida.

555*a*. **Diplodus holbrookii** (Bean) 1362
Drawing by H. L. Todd from a young example, No. 4693, U.S.N.M.

PLATE CCXVIII.

556. **Xystema cinereum** (Walbaum)..... 1372
Drawing by H. L. Todd from No. 35054, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

557. **Gerres olisthostomus** Goode and Bean..... 1376
Drawing by H. L. Todd from the type, No. 25118, U.S.N.M., collected by R. E. Earll in Indian River, Florida.

PLATE CCXIX.

558. **Hermosilla azurea** Jenkins and Evermann..... 1383
Drawing by A. H. Baldwin from the type, No. 36269, U.S.N.M., collected by Jenkins and Evermann at Guaymas, Mexico.

559. **Kyphosus sectatrix** (Linnæus)..... 1387
Drawing by H. L. Todd from No. 20635, U.S.N.M., collected at Woods Hole, Massachusetts.

PLATE CCXX.

Text page.

560. **Medialuna californiensis** (Steindachner) 1391
Drawing by H. L. Todd.

561. **Cynoscion nothus** (Holbrook) 1406
Drawing by H. L. Todd from No. 34921, U.S.N.M., collected by the *Albatross* at Trinidad, West Indies.

562. **Cynoscion regalis** (Bloch and Schneider) 1407

PLATE CCXXI.

563. **Cynoscion nebulosus** (Cuvier and Valenciennes) 1409
Drawing by H. L. Todd.

564. **Sagenichthys ancylodon** (Bloch and Schneider) 1416
Drawing by A. H. Baldwin from No. 29722, U.S.N.M., collected by Dr. Gilbert at Panama.

565. **Larimus argenteus** (Gill) 1421
Drawing by Anna L. Brown from a specimen in L. S. Jr. Univ. Mus.

PLATE CCXXII.

566. **Bairdiella chrysura** (Lacépède) 1433
Drawing by H. L. Todd.

567. **Sciænops ocellatus** (Linnæus) 1453
Drawing by H. L. Todd from No. 622, U.S.N.M., collected by Dr. Kennerly at Indianola, Texas.

PLATE CCXXIII.

568. **Roncador stearnsi** (Steindachner) 1557
Drawing by H. L. Todd from No. 26864, U.S.N.M., collected by Dr. Jordan at Santa Barbara, California.

569. **Leiostomus xanthurus** Lacépède 1458
Drawing by H. L. Todd from No. 20222, U.S.N.M., collected by Samuel Powell at Newport, Rhode Island.

PLATE CCXXIV.

570. **Micropogon undulatus** (Linnæus) 1461
Drawing by H. L. Todd from No. 20742, U.S.N.M., collected by Samuel Powell at Newport, Rhode Island.

571. **Umbrina sinaloæ** Scofield 1468
Drawing by Anna L. Brown from the type, No. 1632, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

PLATE CCXXV.

572. **Menticirrhus americanus** (Linnæus) 1474
Drawing by H. L. Todd from No. 22832, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

573. **Pogonias chromis** (Linnæus) 1482
Drawing by H. L. Todd from No. 18036, U.S.N.M., collected by J. C. Willetts at Matanzas River Inlet, Florida.

PLATE CCXXVI.

Text page.

574. **Aplidonotus grunniens** Rafinesque 1484
Drawing by H. L. Todd from No. 10542, U.S.N.M., collected by J. W. Milner at Ecorse, Michigan.

575. **Eques lanceolatus** (Linnæus) 1489
Drawing by H. L. Todd from No. 32097, U.S.N.M., collected by Professor Poey in Cuba.

PLATE CCXXVII.

576. **Cirrhites rivulatus** Valenciennes 1491
Drawing by A. H. Baldwin from a specimen collected by the *Albatross* in the Pacific.

577. **Hysterocarpus traski** Gibbons 1496
Drawing by J. C. Van Hook.

PLATE CCXXVIII.

578. **Abeona minima** (Gibbons) 1497
Drawing by A. H. Baldwin from No. 26913, U.S.N.M., collected by Dr. Jordan at Santa Barbara, California.

579. **Cymatogaster aggregatus** Gibbons 1498
Drawing by M. M. Smith from No. 31971, U.S.N.M., a male, collected at Fort Wrangell, Alaska, by Capt. H. E. Nichols.

579*a*. **Cymatogaster aggregatus** Gibbons 1498
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

PLATE CCXXIX.

580. **Brachyistius frenatus** Gill 1499
Drawing by A. H. Baldwin from No. 26990, U.S.N.M., collected by Dr. Jordan in Monterey Bay, California.

581. **Zalembius rosaceus** (Jordan and Gilbert) 1500
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

PLATE CCXXX.

582. **Hypocritichthys analis** (A. Agassiz) 1500
Drawing by A. H. Baldwin from No. 27075, U.S.N.M., collected by Dr. Jordan in Monterey Bay, California.

583. **Phanerodon furcatus** Girard 1506
Drawing by A. H. Baldwin from No. 24905, U.S.N.M., collected by Dr. Jordan at San Diego, California.

PLATE CCXXXI.

584. **Rhacochilus toxotes** Agassiz 1507
Drawing from No. 27015, U.S.N.M., collected by Dr. Jordan at Monterey, California.

585. **Hypsurus caryi** (Agassiz) 1508
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

PLATE CCXXXII.

Text page.

586. **Damalichthys argyrosomus** (Girard) 1509
Drawing by H. L. Todd from No. 29811, U.S.N.M., collected by Capt. H. E. Nichols in Friendly Cove, British Columbia.

587. **Cichlasoma bartoni** (Bean) 1515
Drawing by A. H. Baldwin from the type, No. 43765, U.S.N.M., collected by Professor Dugès at Huazteca Potosina, San Luis Potosi, Mexico.

PLATE CCXXXIII.

588. **Azurina hirundo** Jordan and McGregor 1544
Drawing by Anna L. Brown from the type, collected by R. C. McGregor at Guadalupe Island.

589. **Eupomacentrus rectifrenum** (Gill) 1557; 3176
Drawing by Anna L. Brown from No. 3460, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

PLATE CCXXXIV.

590. **Abudefduf saxatilis** (Linnæus) 1561
Drawing by A. H. Baldwin from No. 33688, U.S.N.M, collected by J. C. Brevoort in the West Indies.

591. **Hypsypops rubicundus** (Girard) 1564
Drawing by W. S. Atkinson from No. 43080, U.S.N.M., collected by Rosa Smith at San Diego, California.

PLATE CCXXXV.

592. **Microspathodon bairdii** (Gill) 1566
Drawing by Anna L. Brown from No. 2940, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

593. **Microspathodon chrysurus** (Cuvier and Valenciennes) 1567
Drawing by A. H. Baldwin from No. 13042, U.S.N.M., collected by Professor Poey in Cuba.

PLATE CCXXXVI.

594. **Microspathodon dorsalis** (Gill) 1568
Drawing by Anna L. Brown from No. 2895, L. S. Jr. Univ Mus., type of *M. azurissimus* Jordan and Starks, collected by the Hopkins Expedition at Venados Island, Mazatlan, Mexico.

595. **Tautogolabrus adspersus** (Walbaum) 1577
Drawing by H. L. Todd from No. 17745, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

PLATE CCXXXVII.

Text page.

596. **Tautoga onitis** (Linnæus) 1578
Drawing by H. L. Todd from No. 17738, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

597. **Lachnolaimus maximus** (Walbaum) 1579
Drawing by H. L. Todd.

PLATE CCXXXVIII.

598. **Pimelometopon pulcher** (Ayres) 1585
Drawing by H. L. Todd from No. 24890, U.S.N.M., collected by Dr. Jordan at San Diego, California.

599. **Clepticus parræ** (Bloch and Schneider) 1586
Drawing by A. H. Baldwin from No. 9797, U.S.N.M., collected by Professor Poey in Cuba.

PLATE CCXXXIX.

600. **Iridio radiatus** (Linnæus) 1590
Drawing by H. L. Todd from No. 31168, U.S.N.M., collected at Key West, Florida.

601. **Irido bivittatus** (Bloch) 1595
Drawing by A. H. Baldwin from No. 35168, U.S.N.M., collected at Key West, Florida.

PLATE CCXL.

602. **Iridio dispilus** (Günther) 1597
Drawing by Anna L. Brown from No. 2904, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition in the Astillero at Mazatlan, Mexico.

603. **Emmeekia venusta** (Jenkins & Evermann) 1602
Drawing by A. H. Baldwin from the type, No. 39631, U.S.N.M., collected by Jenkins & Evermann at Guaymas, Mexico.

PLATE CCXLI.

604. **Chlorichthys grammaticus** (Gilbert) 1610
Drawing by A. H. Baldwin from No. 46934, U.S.N.M., collected by the *Albatross* at Socorro Island.

605. **Novaculichthys ventralis** (Bean) 1615
Drawing by S. F. Denton from the type, No. 37077, U.S.N.M., collected by Dr. Bean at Cozumel Island.

606. **Novaculichthys infirmus** (Bean) 1616
Drawing by H. L. Todd from the type, No. 37076, U.S.N.M., collected by Dr. Bean at Cozumel Island.

PLATE CCXLII.

607. **Xyrichthys psitticus** (Linnæus) 1618
Drawing by H. L. Todd from No. 5815, U.S.N.M., collected by Dr. Whitehurst at Garden Key, Florida.

608. **Crytotomus beryllinus** (Jordan and Swain) 1625
Drawing by H. L. Todd from a specimen collected by the *Albatross*.

PLATE CCXLIII.

Text page.

609, 609*a*. **Calotomus xenodon** Gilbert 1626
Drawings by A. H. Baldwin from No. 46935, U.S.N.M., collected by the *Albatross* at Socorro Island.

610. **Sparisoma aurofrenatum** (Cuvier and Valenciennes) 1634
Drawing by Anna L. Brown from a specimen in L. S. Jr. Univ. Mus.

PLATE CCXLIV.

611. **Sparisoma hoplomystax** (Cope) 1632
Drawing by H. L. Todd from No. 35173, U.S.N.M., type of *S. cyanolene* Jordan and Swain, collected by Jordan and Dye at Key West, Florida.

612. **Scarus cuzamilæ** Bean 1648
Drawing by S. F. Denton from the type, No. 37128, U.S.N.M., collected by Dr. Bean at Cozumel Island.

613. **Jaws of Scarus cæruleus** (Bloch) 1652
Drawing by Anna L. Brown from a specimen in L. S. Jr. Univ. Mus.

PLATE CCXLV.

614. **Scarus emblematicus** Jordan and Rutter 1654
Drawing by W. S. Atkinson from the type in L. S. Jr. Univ. Mus., collected by Rev. J. S. Roberts in Jamaica.

615, 615*a*. **Scarus strongylocephalus** .....
Lower and upper pharyngeal bones. Drawings by Anna L. Brown.

616, 616*a*. **Sparisoma cretense** .....
Lower and upper pharyngeal bones. Drawings by Anna L. Brown.

PLATE CCXLVI.

617. **Pseudoscarus guacamaia** (Cuvier) 1657
Drawing by H. L. Todd.

618. **Zenopsis ocellatus** (Storer) 1660
Drawing from a specimen in the Boston Society of Natural History.

PLATE CCXLVII.

619. **Chætodipterus faber** (Broussonet) 1668
Drawing by H. L. Todd from No. 22921, U.S.N.M., from east coast of United States.

PLATE CCXLVIII.

620. **Chætodon nigrirostris** (Gill) 1673
Drawing by W. S. Atkinson from No. 5981, L. S. Jr. Univ. Mus., collected by R. C. McGregor at Clarion Island.

PLATE CCXLIX.

Text page.

621. **Chætodon ocellatus** (Bloch) 1674
Drawing by W. S. Haines. Specimen collected by Dr. Bean at Beesley's Point, New Jersey.

PLATE CCL.

622. **Chætodon capistratus** Linnæus..... 1677
Drawing by M. M. Smith from No. 30143, U.S.N.M., received from the Public Museum of Kingston, Jamaica.

PLATE CCLI.

623. **Pomacanthus arcuatus** (Linnæus) 1679
Drawing by H. L. Todd from No. 33197, U.S.N.M., collected by Lewis G. Mitchell at Barnegat, New Jersey.

PLATE CCLII.

624. **Pomacanthus zonipectus** (Gill)..... 1681
Drawing from No. 31482, U.S.N.M., collected by Kaiser and Martin in West Florida.

PLATE CCLIII.

625. **Holacanthus tricolor** (Bloch) 1684
Drawing by A. H. Baldwin from a specimen collected by Dr. Evermann at Arroyo, Puerto Rico.

PLATE CCLIV.

626. **Angelichthys ciliaris** (Linnæus)..... 1684
Drawing by A. H. Baldwin from No. 30023, U.S.N.M., received from the Public Museum at Kingston, Jamaica.

626*a*. **Angelichthys ciliaris** (Linnæus), skeleton showing vertebræ reduced in number and enlarged 1684
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

PLATE CCLV.

627. **Zanclus cornutus** (Linnæus) 1687
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

PLATE CCLVI.

628. **Teuthis crestonis** Jordan and Starks..... 1692
Drawing by Anna L. Brown from the type, No. 2899, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition in the Astillero at Mazatlan, Mexico.

629. **Teuthis bahianus** (Castelnau) 1693
Drawing by H. L. Todd from No. 3424, U.S.N.M., collected at Garden Key, Florida.

PLATE CCLVII.

Text page.

629*a*. **Tail of Teuthis bahianus** (Castelnau) 1693

630. **Xesurus punctatus** (Gill) 1694
Drawing by Anna L. Brown from No. 2911, U.S.N.M., collected by the Hopkins Expedition at Mazatlan, Mexico.

PLATE CCLVIII.

631. **Balistes carolinensis** Gmelin 1701
Drawing by H. L. Todd from No. 15233, U.S.N.M., collected at New York.

632. **Cantherines carolæ** Jordan and McGregor 1713
Drawing by Anna L. Brown from the type, No. 11995, L. S. Jr. Univ. Mus., collected by R. C. McGregor at Socorro Island.

PLATE CCLIX.

633. **Monacanthus ciliatus** (Mitchill) 1714
Drawing by W. S. Haines.

634. **Monacanthus hispidus** (Linnæus) 1715
Drawing by W. S. Haines.

PLATE CCLX.

635. **Alutera schœpfii** (Walbaum) 1718
Drawing by W. S. Haines from No. 6068, U.S.N.M., collected by Judge Steele at Cedar Keys, Florida.

636. **Alutera scripta** (Osbeck) 1719
Drawing by W. S. Haines from No. 34397, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

PLATE CCLXI.

637. **Lactophrys triqueter** (Linnæus) 1722
Drawing by W. S. Haines from No. 5989, U.S.N.M., collected at Garden Key, Florida, by Dr. Whitehurst.

638. **Lactophrys tricornis** (Linnæus) 1724
Drawing by W. S. Haines from No. 21548, U.S.N.M., collected by C. C. Leslie at Charleston, South Carolina.

PLATE CCLXII.

639, 639*a*, 639*b*. **Lactophrys bicaudalis** (Linnæus) 1723
Drawings by H. L. Todd from No. 37130, U.S.N.M., collected at Cozumel Island by the *Albatross;* 640a, ventral view; 640b, front view.

PLATE CCLXIII.

640, 640*a*. **Lactophrys trigonus** (Linnæus) 1723
Drawing by H. L. Todd from No. 7987, U.S.N.M., collected at Garden Key, Florida, by Dr. Whitehurst.

641. **Lagocephalus lævigatus** (Linnæus) 1728
Drawing by H. L. Todd from No. 35135, U.S.N.M.

PLATE CCLXIV.

Text page.

642. **Spheroides nephelus** Goode and Bean 1732
Drawing by H. L. Todd from No. 31428, U.S.N.M., the type, collected by R. E. Earll in Indian River, Florida.

643. **Spheroides spengleri** (Bloch) 1732
Drawing from No. 20608, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

644. **Spheroides maculatus** (Bloch and Schneider) 1733
Drawing by W. S. Haines from No. 14827, U.S.N.M., collected by the U. S. Fish Commission at Noank, Connecticut.

PLATE CCLXV.

645, 645*a*. **Spheroides testudineus** (Linnæus) 1734
Drawings by H. L. Todd from No. 30060, U.S.N.M., received from the museum at Kingston, Jamaica.

646. **Ovoides setosus** (Rosa Smith) 1739
Drawing by W. S. Atkinson from No. 319, L. S. Jr. Univ. Mus., collected by the *Albatross* at Clarion Island.

PLATE CCLXVI.

647. **Diodon hystrix** Linnæus 1745
Drawing by H. L. Todd from No. 5985, U.S.N.M., collected by H. E. Wright at Tortugas Islands.

648. **Chilomycterus schœpfi** (Walbaum) 1748
Drawing from a specimen collected at Noank, Connecticut.

PLATE CCLXVII.

649. **Lyosphæra globosa** Evermann and Kendall 1751
Drawing by A. H. Baldwin from the type, No. 48794, U.S.N.M., collected by W. C. Kendall in the Rappahannock River, Virginia.

649*a*. **Lyosphæra globosa** Evermann and Kendall 1751
Drawing by A. H. Baldwin from the cotype, a young example collected by Evermann and Kendall at Cape Florida, Florida.

650. **Mola mola** (Linnæus) 1753
Drawing taken from a washed drawing taken from a cast.

PLATE CCLXVIII.

651. **Ranzania truncata** (Retzius) 1755
Drawing from a specimen collected in the Bermudas.

652. **Sebastes marinus** (Linnæus) 1760
Drawing by H. L. Todd.

PLATE CCLXIX.

Text page.

653. **Sebastolobus altivelis** Gilbert 1763
Drawing by A. H. Baldwin from the type collected by the *Albatross* at Station 3338, south of the Alaskan Peninsula, in 625 fathoms.

654. **Sebastodes melanops** (Girard) 1782
Drawing by H. L. Todd from No. 27628, U.S.N.M., collected by Dr. Bean at Sitka, Alaska.

PLATE CCLXX.

655. **Sebastodes ciliatus** (Tilesius) 1783
Drawing by H. L. Todd from No. 32014, U.S.N.M., collected in Tolstoi Bay, Alaska, by Capt. H. E. Nichols.

656. **Sebastodes mystinus** (Jordan and Gilbert) 1784
Drawing by H. L. Todd from No. 27031, U.S.N.M., collected by Dr. Jordan at Monterey, California.

PLATE CCLXXI.

657. **Sebastodes brevispinis** (Bean) 1787
Drawing by W. S. Haines from the type, No. 32004, U.S.N.M., collected by Capt. H. E. Nichols in Hassler Harbor, Alaska.

658. **Sebastodes eigenmanni** Cramer 1789
Drawing by Anna L. Brown from the type, No. 4046, L. S. Jr. Univ. Mus., collected by Dr. W. W. Thoburn at Pacific Grove, California.

PLATE CCLXXII.

659. **Sebastodes hopkinsi** Cramer 1789
Drawing by Anna L. Brown from the type, No. 2282, L. S. Jr. Univ. Mus., collected by Gilbert and Starks at Pacific Grove, California.

660. **Sebastodes alutus** (Gilbert) 1790
Drawing by A. H. Baldwin from the type, No. 48244, U.S.N.M., collected by the *Albatross* at Station 3339, Santa Barbara Islands.

PLATE CCLXXIII.

661. **Sebastodes pinniger** (Gill) 1793
Drawing by H. L. Todd from No. 27488, U.S.N.M., collected by J. G. Swan at Neah Bay, Washington.

662. **Sebastodes miniatus** (Jordan and Gilbert) 1794
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus., showing vertebræ in moderate number, relatively increased in size.

PLATE CCLXXIV.

Text page.

663. **Sebastodes caurinus** (Richardson) 1820
Drawing by H. L. Todd from No. 31999, U.S.N.M., collected by Capt. H. E. Nichols in Departure Bay, British Columbia.

664. **Sebastodes maliger** (Jordan and Gilbert) 1822
Drawing by H. L. Todd from No. 27713, U.S.N.M., collected by Dr. Bean at Sitka, Alaska.

PLATE CCLXXV.

665. **Sebastodes gilberti** Cramer 1823
Drawing by Anna L. Brown from the type, No. 3893, L. S. Jr. Univ. Mus., collected by Dr. Jordan in the San Francisco market.

666. **Sebastodes serriceps** (Jordan and Gilbert) 1827
Drawing by H. L. Todd from No. 27041, U.S.N.M., collected by Dr. Jordan at Monterey, California.

PLATE CCLXXVI.

667. **Sebastodes nigrocinctus** (Ayres) 1827
Drawing by H. L. Todd from No. 27285, U.S.N.M., collected by Dr. Jordan in Puget Sound.

668. **Scorpæna cristulata** Goode and Bean 1841
Drawing by H. L. Todd from the type, No. 39326, U.S.N.M., collected by the *Albatross* at Station 2415, in N. lat. 30° 44′, W. long. 79° 26′, off Georgia, in 440 fathoms.

PLATE CCLXXVII.

669. **Scorpæna brasiliensis** Cuvier and Valenciennes 1842
Drawing by H. L. Todd from No. 30169, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

670. **Scorpæna mystes** Jordan and Starks 1849
Drawing by Anna L. Brown from the type, No. 2919, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

PLATE CCLXXVIII.

671. **Scorpæna grandicornis** Cuvier and Valenciennes 1850
Drawing by H. L. Todd from No. 35101, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

672. **Pontinus macrolepis** Goode and Bean 1855
Drawing by A. H. Baldwin from a specimen collected by the *Blake* off Barbados.

PLATE CCLXXIX.

673. **Setarches parmatus** Goode 1860
Drawing by H. L. Todd from a specimen collected by the *Albatross* at Station 2397.

.ext page

674. **Anoplopoma fimbria** (Pallas) 1862
Drawing by H. L. Todd.

675. **Pleurogrammus monopterygius** (Pallas) 1864
Drawing by A. H. Baldwin from a specimen collected by Dr. Evermann at Atka Island, Alaska.

PLATE CCLXXX.

676. **Hexagrammos decagrammus** (Pallas) 1867
Drawing by W. S. Haines from No. 27710, U.S.N.M., collected at Old Sitka by L. A. Beardslee.

676*a*. **Skeleton of Hexagrammos decagrammus** 1867
A mail-cheeked fish from northern waters, showing vertebræ increased in number and diminished in size. Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

677. **Hexagrammos octogrammus** (Pallas) 1869
Drawing by W. S. Haines from No. 27975, U.S.N.M., collected at Unalaska by Dall and Bean.

PLATE CCLXXXI.

678. **Hexagrammos stelleri** Tilesius 1871
Drawing by H. L. Todd from No. 21530, U.S.N.M., collected at St. Michaels, Alaska, by L. M. Turner.

679. **Hexagrammos superciliosus** (Pallas) 1872
Drawing by M. M. Smith from No. 27934, U.S.N.M., collected at Chernoffsky, Unalaska Island, by T. H. Bean.

680. **Hexagrammos otakii** Jordan and Starks 1867
Drawing by Anna L. Brown from the type, No. 3704, L. S. Jr. Univ. Mus., collected by Keinosuke Otaki at Tokio, Japan.

PLATE CCLXXXII.

681. **Ophidion elongatus** Girard 1875
Drawing by H. L. Todd from No. 27657, U.S.N.M., collected by Dr. Bean at Sitka, Alaska.

682. **Oxylebius pictus** Gill 1878
Drawing by Anna L. Brown from No. 2381, L. S. Jr. Univ Mus., collected by the California Fish Commission at San Francisco, California.

683. **Jordania zonope** Starks 1884
Drawing by Anna L. Brown from the type, No. 3124, L. S. Jr Univ. Mus., collected by Miss Maude Parker and Adam Hubbert at Point Orchard, Puget Sound, Washington

PLATE CCLXXXIII.

684. **Alcidea thoburni** (Gilbert) 1887
Drawing by A. H. Baldwin from a specimen collected by the *Albatross* at Station 3350.

685. **Skull of Scorpænichthys marmoratus** (Ayres) 1889

Text page.

686. **Chitonotus pugetensis** (Steindachner) 1890
Drawing by A. H. Baldwin from No. 27238, U.S.N.M., collected by Dr. Jordan in the Straits of Juan de Fuca, Washington.

PLATE CCLXXXIV.

687. **Icelinus borealis** Gilbert 1896
Drawing by A. H. Baldwin from the type collected by the *Albatross* at Station 3223.

688. **Astrolytes notospilotus** (Girard) 1899
Drawing by A. H. Baldwin from No. 27146, U.S.N.M., collected by Dr. Jordan in Puget Sound.

688*a*. **Astrolytes notospilotus** (Girard) 1899
Drawing from No. 23936, U.S.N.M., a young example, collected by W. H. Dall in the Shumagin Islands.

PLATE CCLXXXV.

689. **Artediellus atlanticus** Jordan and Evermann 1906
Drawing by H. L. Todd from the type, No. 21069, U.S.N.M., collected in Massachusetts Bay in 90 fathoms.

690. **Ruscarius meanyi** Jordan and Starks 1908
Drawing by Anna L. Brown from the type, No. 3127, L. S. Jr. Univ. Mus., collected by E. C. Starks at Point Orchard, Puget Sound, Washington.

PLATE CCLXXXVI.

691. **Rastrinus scutiger** (Bean) 1909
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

692. **Icelus spiniger** Gilbert 1914
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3278.

693. **Icelus canaliculatus** Gilbert 1917
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3329, off Unalaska.

PLATE CCLXXXVII.

694. **Radulinus boleoides** Gilbert 1919
Drawing by A. H. Baldwin from the type, No. 48795, U.S.N.M., collected by the *Albatross* at Station 3664, off Santa Catalina Island, California, in 59 fathoms.

695. **Radulinus asprellus** Gilbert 1920
Drawing by Anna L. Brown from No. 3781, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound, near Seattle, Washington.

696. **Triglops pingeli** Reinhardt 1923
Drawing by H. L. Todd from a specimen taken in trawl 8 miles off Chebucto in 521 fathoms.

PLATE CCLXXXVIII.

Text page.

697. **Triglops beani** Gilbert 1924
Drawing by H. L. Todd from the type, collected by the *Albatross* at Station 3220.

698. **Triglops scepticus** Gilbert 1925
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3339.

699. **Sternias xenostethus** (Gilbert) 1927
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3220, north of Unalaska, in 34 fathoms.

699*a*. **Sternias xenostethus** (Gilbert) 1927
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3220, north of Unalaska, in 34 fathoms.

PLATE CCLXXXIX.

700. **Prionistius macellus** Bean 1928
Drawing by H. L. Todd from the type, No. 31958, U.S.N.M., collected by Capt. H. E. Nichols in Carter Bay, British Columbia.

701. **Elanura forficata** Gilbert 1930
Drawing by Anna L. Brown from the type, collected by the *Albatross* at Station 3214, in the Aleutian Islands.

702. **Melletes papilio** Bean 1932
Drawing by H. L. Todd from the type, No. 23751, U.S.N.M., collected by H. W. Elliott at St. Paul Island, Pribilof Group, Bering Sea.

PLATE CCXC.

703. **Hemilepidotus jordani** Bean 1934
Drawing by H. L. Todd from the type, No. 27598, U.S.N.M., collected by Sylvanus Bailey at Unalaska.

704, 704*a*, 704*b*. **Hemilepidotus hemilepidotus** (Tilesius) 1935
Drawings by S. F. Denton from No. 27609, U.S.N.M., collected at Sitka by T. H. Bean.

PLATE CCXCI.

705. **Enophrys bison** (Girard) 1738
Drawing by H. L. Todd from a specimen collected by Dr. Jordan in Puget Sound.

706. **Ceratocottus diceraus** (Pallas) 1940
Drawing by W. S. Haines, from No. 32007, U.S.N.M., collected by Capt. H. E. Nichols in Tolstoi Bay, Alaska.

PLATE CCXCII.

707. **Cottus evermanni** Gilbert 1945
Drawing by Chloe Lesley Starks from the type, No. 48228, U.S.N.M., collected by Gilbert, Cramer, and Otaki in Lost River, near Lostine, Oregon.

Text page.

708. **Cottus punctulatus** (Gill) 1948
Drawing by S. F. Denton from a specimen collected in Yellowstone Park by Dr. Jordan.

PLATE CCXCIII.

709. **Cottus perplexus** Gilbert and Evermann 1955
Drawing by A. H. Baldwin from the type, No. 45387, U.S.N.M., collected by Drs. Gilbert and Jenkins in the Skookumchuck River, near Chehalis, Washington.

710. **Cottus klamathensis** Gilbert 1955
Drawing by Anna L. Brown from the type, No. 48226, U.S.N.M., collected by Gilbert, Cramer, and Otaki, in Upper Klamath Lake, Oregon.

711. **Cottus aleuticus** Gilbert 1957
Drawing from No. 26922, U.S.N.M., the type of *Uranidea microstoma* Lockington, collected by W. J. Fischer at St. Paul, Kadiak Island, Alaska.

PLATE CCXCIV.

712. **Cottus leiopomus** Gilbert and Evermann 1962
Drawing by A. H. Baldwin from the type, No. 45389, U.S.N.M., collected by H. H. Kinsey in Little Wood River, near Shoshone, Idaho.

713. **Cottus princeps** Gilbert 1962
Drawing by Anna L. Brown from the type, No. 48227, U.S.N.M., collected by Gilbert, Cramer, and Otaki in Upper Klamath Lake, Oregon.

714. **Uranidea tenuis** Evermann and Meek 1966
Drawing by A. H. Baldwin from the type, No. 48229, U.S.N.M., collected by Meek and Alexander in Upper Klamath Lake, Oregon.

PLATE CCXCV.

715, 715*a*. **Myoxocephalus æneus** (Mitchill) 1972
Drawings by H. L. Todd from No. 15093, U.S.N.M., collected by Mr. Copley at Tompkinsville, New York.

716. **Myoxocephalus scorpius** (Linnæus) 1974
Drawing by H. L. Todd from No. 21989, U.S.N.M., collected by L. Kumlein in Cumberland Gulf.

PLATE CCXCVI.

717 **Myoxocephalus octodecimspinosus** (Mitchill) 1976
Drawing by H. L. Todd from No. 4552, U.S.N.M., collected by Professor Baird at Beesley Point, New Jersey.

718. **Myoxocephalus polyacanthocephalus** Pallas 1976
Drawing by H. L. Todd from No. 23499, U.S.N.M., collected by W. H. Dall at Unalaska, Alaska.

719. **Myoxocephalus jaok** (Cuvier and Valenciennes) 1977
Drawing by H. L. Todd from No. 21522, U.S.N.M., collected by [illegible] M. Turner at St. Michaels, Alaska.

PLATE CCXCVII.

Text page.

720, 720*a*. **Myoxocephalus verrucosus** (Bean) 1979
Drawing by H. L. Todd from No. 27847, U.S.N.M., collected by Dall and Bean in Plover Bay, Alaska.

721. **Myoxocephalus axillaris** (Gill) 1980
Drawing by H. L. Todd from No. 32442, U.S.N.M., collected by U. S. Signal Service Point Barrow Expedition at Bering Straits, Alaska.

PLATE CCXCVIII.

722, 722*a*, 722*b*. **Myoxocephalus stelleri** Tilesius 1981
Drawings by H. L. Todd from No. 32442, U.S.N.M., collected by U. S. Signal Service at Bering Straits, Alaska.

723. **Myoxocephalus niger** (Bean) 1985
Drawing by H. L. Todd from the type, No. 27971, U.S.N.M., collected by Dr. Bean at St. Paul Island, Bering Sea.

PLATE CCXCIX.

724, 724*a*. **Megalocottus platycephalus** (Pallas) 1987
Drawings by A. H. Baldwin from No. 21522, U.S.N.M., collected at St. Michaels, Alaska, by L. M. Turner.

725, 725*a*. **Megalocottus laticeps** (Gilbert) 1988
Drawings by A. H. Baldwin from the type, collected by the *Albatross* in the Nushagak River, Alaska.

PLATE CCC.

726. **Zesticelus profundorum** (Gilbert) 1990
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3329 in Bering Sea, north of Unalaska.

727. **Dasycottus setiger** Bean 1991
Drawing by Anna L. Brown from No. 3761, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound, near Seattle, Washington.

728. **Oncocottus quadricornis** (Linnæus) 2001
Drawing by W. S. Haines from No. 32962, U.S.N.M., collected by E. W. Nelson at St. Michaels, Alaska.

PLATE CCCI.

729, 729*a*, 729*b*. **Gymnocanthus pistilliger** (Pallas) 2006
Drawings by H. L. Todd from No. 21743, U.S.N.M., collected at Niantilik Harbor, Cumberland Gulf, by Ludwig Kumlien.

730. **Gymnocanthus galeatus** Bean 2010
Drawing by W. S. Haines from the type, No. 28097, U.S.N.M., collected by Dr. Bean at Unalaska, Alaska.

PLATE CCCII.

Text page.

731. **Leiocottus hirundo** Girard 2011
Drawing by A. H. Baldwin from No. 313, U.S.N.M., collected by W. P. Trowbridge at San Miguel, California.

732. **Leptocottus armatus** Girard 2012
Drawing by H. L. Todd from No. 27968, U.S.N.M., collected at Sitka, Alaska, by Dr. Bean.

733. **Oligocottus maculosus** Girard 2013
Drawing by H. L. Todd from No. 27514, U.S.N.M., collected by Dr. Bean at Sitka, Alaska.

PLATE CCCIII.

734. **Blennicottus embryum** (Jordan and Starks) 2016; 2864
Drawing by Anna L. Brown from the type, No. 3128, L. S. Jr. Univ. Mus., collected by E. C. Starks, Neah Bay, Washington.

735. **Histiocottus bilobus** (Cuvier and Valenciennes) 2018
Drawing by W. S. Haines from No. 30307, U.S.N.M., collected by W. J. Fischer at St. Paul, Kadiak Island, Alaska.

PLATE CCCIV.

736. **Blepsias cirrhosus** (Pallas) 2018
Drawing by A. H. Baldwin from No. 27118, U.S.N.M., collected by Dr. Jordan in the Straits of Fuca.

736*a*, 736*b*. **Blepsias cirrhosus** (Pallas) 2018
Drawings by H. L. Todd from No. 30307, U.S.N.M., collected by W. J. Fischer at St. Paul, Kadiak Island, Alaska.

PLATE CCCV.

738. **Hemitripterus americanus** (Gmelin) 2023
Drawing by H. L. Todd from No. 23199, U.S.N.M., collected by the U. S. Fish Commission at Halifax, Nova Scotia, in 16 fathoms.

739. **Ascelichthys rhodorus** Jordan and Gilbert 2025
Drawing by A. H. Baldwin from No. 28488, U.S.N.M., collected by J. G. Swan at Neah Bay, Washington.

PLATE CCCVI.

740. **Psychrolutes paradoxus** Günther 2026
Drawing by Anna L. Brown from No. 3371, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound near Point Orchard, Washington.

741. **Gilbertidia sigolutes** (Jordan and Starks) 2028
Drawing by Anna L. Brown from the type, No. 3129, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound near Point Orchard, Washington.

PLATE CCCVII.

Text page.

742, 742*a*. **Rhamphocottus richardsoni** Günther 2030
Drawings by H. L. Todd from a specimen collected by W. N. Lockington, in California.

742*b*, 742*c*. **Rhamphocottus richardsoni** Günther 2030
Drawings by Anna L. Brown from No. 3385, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound near Point Orchard, Washington.

PLATE CCCVIII.

743. **Occa dodecaedron** (Tilesius) 2044
Drawing by Anna L. Brown from No. 14936, U.S.N.M., collected by Gordon Prince in Kamchatka.

744. **Pallasina barbata** (Steindachner) 2049
Drawing by H. L. Todd from No. 28052, U.S.N.M., collected at Port Mulgrave, Alaska, by Dr. Bean.

745, 745*a*. **Podothecus accipiter** Jordan and Starks 2055
Drawing by Anna L. Brown from the type, No. 3835, L. S. Jr. Univ. Mus., collected by Capt. J. C. Blair at Robben Island.

PLATE CCCIX.

746. **Podothecus acipenserinus** (Tilesius) 2061
Drawing by M. M. Smith from No. 32481, U.S.N.M., collected by W. J. Fischer at Kadiak Island, Alaska.

747, 747*a*. **Podothecus veternus** Jordan and Starks 2063
Drawing by Anna L. Brown from the type, No. 4823, L. S. Jr. Univ. Mus., collected by Capt. J. C. Blair at Robben Island.

748, 748*a*. **Stelgis vulsus** (Jordan and Gilbert) 2067
Drawing by Anna L. Brown from the type in the U.S.N.M., collected by Jordan and Gilbert at Point Reyes, California.

749, 749*a*. **Averruncus emmelane** Jordan and Starks 2069
Drawing by Anna L. Brown from the type, No. 3135, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound near Point Orchard, Washington.

PLATE CCCX.

750, 750*a*. **Averruncus sterletus** Gilbert 2071
Drawings by Anna L. Brown from the type in the U.S.N.M., collected by the *Albatross* at Station 3662, off Avalon, Coronado Island, California, in 47 fathoms.

751. **Sarritor frenatus** (Gilbert) 2073
Drawing by A. H. Baldwin from the type collected by the *Albatross* at Station 3229.

Text page.

752, 752*a*. **Xystes axinophrys** Jordan and Starks 2076
Drawings by Anna L. Brown from the type, No. 3130, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound near Seattle, Washington.

PLATE CCCXI.

753. **Bathygonus nigripinnis** Gilbert 2078
Drawing by A. H. Baldwin from No. 46614, U.S.N.M., collected by the *Albatross* in the Aleutian Islands.

754, 754*a*. **Xenochirus triacanthus** Gilbert 2084
Drawings by Anna L. Brown from No. 3760, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound near Seattle, Washington.

PLATE CCCXII.

755, 755*a*, 755*b*. **Aspidophoroides guntheri** Bean 2090
Drawings by W. S. Haines from No. 37032, U.S.N.M., collected by G. M. Stoney in Alaska.

756, 756*a*. **Aspidophoroides monopterygius** (Bloch) 2091
Drawings by H. L. Todd from No. 21761, U.S.N.M., collected by the U. S. Fish Commission at Sandwich Point, Halifax, Nova Scotia, in 18 fathoms.

PLATE CCCXIII.

757. **Cyclopterus lumpus** Linnæus 2096
Drawing by H. L. Todd from No. 14795, U.S.N.M., collected by the U. S. Fish Commission at Eastport, Maine.

758. **Lethotremus muticus** Gilbert 2101
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3223, in Unimak Pass, Alaska.

PLATE CCCXIV.

759. **Lethotremus vinolentus** Jordan and Starks 2101
Drawing by Anna L. Brown from the type, No. 3131, L. S. Jr. Univ. Mus., collected by E. C. Starks in Puget Sound, near Seattle, Washington.

760, 760*a*. **Neoliparis callyodon** (Pallas) 2110
Drawings by M. M. Smith from No. 30317, U.S.N.M., collected by W. J. Fischer at St. Paul, Kadiak Island, Alaska.

PLATE CCCXV.

761, 761*a*. **Neoliparis mucosus** (Ayres) 2111
Drawings by Anna L. Brown from No. 360, Cal. Acad. Sci., collected by H. D. Dunn off San Francisco, California.

Text page.

762. **Neoliparis floræ** Jordan and Starks 2111
Drawing by Anna L. Brown from the type, No. 3126, L. S. Jr. Univ. Mus., collected by E. C. Starks at Waádda Island, Neah Bay, Washington.

PLATE CCCXVI.

763, 763*a*. **Neoliparis greeni** Jordan and Starks 2112
Drawings by Anna L. Brown from the type, No. 3019, L. S. Jr. Univ. Mus., collected by A. N. Green in Victoria Harbor, Victoria, British Columbia.

764, 764*a*. **Liparis cyclopus** Günther 2118
Drawings by H. L. Todd from No. 24007, U.S.N.M., collected at Port Muller, Alaska, by W. H. Dall.

PLATE CCCXVII.

765. **Liparis agassizii** Putnam 2121
Drawing by H. L. Todd from one of the types of *L. gibbus* Bean, No. 24047, U.S.N.M., collected at St. Paul Island, Bering Sea, by H. W. Elliott.

766, 766*a*. **Liparis dennyi** Jordan and Starks 2124
Drawings by Anna L. Brown from the type, No. 3703, L. S. Jr. Univ. Mus., collected by E. C. Starks in Admiralty Inlet, near Seattle, Washington.

PLATE CCCXVIII.

767. **Bathyphasma ovigerum** Gilbert 2128
Drawing by A. H. Baldwin from the type, No. 48622, U.S.N.M., collected by the *Albatross* at Station 3342, off Queen Charlotte Island, in 1,588 fathoms.

768. **Prionotus carolinus** (Linnæus) 2156
Drawing by H. L. Todd from No. 774, U.S.N.M., collected by Professor Baird at Beesleys Point, New Jersey.

PLATE CCCXIX.

769. **Prionotus scitulus** Jordan 2157
Drawing by H. L. Todd from a specimen collected by G. Würdemann in Florida.

770. **Prionotus alatus** Goode and Bean 2159
Drawing from the type, collected in deep water off Charleston, South Carolina.

PLATE CCCXX.

771. **Prionotus stearnsi** Jordan and Swain 2166
Drawing from a specimen obtained on the Pensacola Snapper Banks.

772. **Prionotus evolans** (Linnæus) 2168
Drawing by H. L. Todd from No. 5556, U.S.N.M., collected by Professor Baird at Woods Hole, Massachusetts.

PLATE CCCXXI.

Text page.

773. **Bellator egretta** (Goode and Bean) 2174
Drawing by M. M. Smith from the type in the M. C. Z., collected by the *Blake* at Station LXIV, off Barbados.

774. **Peristedion miniatum** Goode 2178
Drawing by H. L. Todd from the type, No. 26023, U.S.N.M., collected by the *Fish Hawk* at Station 869, in N. lat. 40° 02′ 18″, W. long. 70° 23′ 06″, in 192 fathoms.

775. **Peristedion longispathum** Goode and Bean 2178
Drawing by H. L. Todd from the type, collected by the *Blake* at Station LVIII, off Havana, in 242 fathoms.

PLATE CCCXXII.

776. **Peristedion gracile** Goode and Bean 2179
Drawing by H. L. Todd from the type, collected by the *Albatross* at Station 2401, in N. lat. 28° 38′ 30″, W. long. 85° 52′ 30″, in 142 fathoms.

777, 777*a*. **Peristedion platycephalum** Goode and Bean 2180
Drawings by H. L. Todd from the type, collected by the *Blake* at Station LX, off Barbados, in 123 fathoms.

PLATE CCCXXIII.

778. **Cephalacanthus volitans** (Linnæus) 2183
Drawing by W. S. Haines.

779. **Callionymus agassizii** Goode and Bean 2186
Drawing by H. L. Todd from a specimen collected by the *Blake* at Station XXX, off Barbados, in 209 fathoms.

780. **Ioglossus calliurus** Bean 2193
Drawing from No. 30797, U.S.N.M., collected by Silas Stearns at the Pensacola Snapper Banks.

PLATE CCCXXIV.

781. **Philypnus dormitor** (Lacépède) 2194
Drawing by A. H. Baldwin from a specimen collected by Dr. Evermann at Palo Seco, Puerto Rico.

782. **Dormitator maculatus** (Bloch) 2196
Drawing by A. H. Baldwin from a specimen collected by Dr. Evermann at Hucares, Puerto Rico.

PLATE CCCXXV.

783. **Eleotris pisonis** (Gmelin) 2200
Drawing by A. H. Baldwin from No. 5757, U.S.N.M., collected by Dr. Whitehurst at Garden Key, Florida.

784. **Alexurus armiger** Jordan and Richardson 2203
Drawing by Anna L. Brown from the type, No. 3455, L. S. Jr. Univ. Mus., collected by J. A. Richardson in La Paz Harbor, Lower California.

785. **Erotelis smaragdus** (Cuvier and Valenciennes) 2204
Drawing by A. H. Baldwin.

PLATE CCCXXVI.

Text page.

786. **Lophogobius cyprinoides** (Pallas) 2209
Drawing by A. H. Baldwin from No. 37509, U.S.N.M., collected by Professor Poey in Cuba.

787. **Gobius stigmaticus** (Poey) 2224
Drawing by W. S. Haines from No. 30469, U.S.N.M., collected by Silas Stearns in south Florida.

788. **Gobius hastatus** Girard 2229
Drawing by H. L. Todd from No. 35155, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

PLATE CCCXXVII.

789. **Gobius oceanicus** Pallas 2230
Drawing by A. H. Baldwin from No. 35155, U.S.N.M., collected by Dr. Jordan at Key West, Florida.

789*a*. **Gobius oceanicus** Pallas 2230
Drawing by A. H. Baldwin from a specimen collected by Dr. Evermann at Palo Seco, Puerto Rico.

790. **Garmannia paradoxa** (Günther) 2232
Drawing by Anna L. Brown from No. 3765, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

PLATE CCCXXVIII.

791. **Bollmannia chlamydes** Jordan 2238
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus., collected by the *Albatross* off the coast of Colombia.

792. **Aboma etheostoma** Jordan and Starks 2240
Drawing by Anna L. Brown from the type, No. 3459, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition in the Astillero at Mazatlan, Mexico.

793. **Clevelandia ios** (Jordan and Gilbert) 2254
Drawing by Anna L. Brown from No. 3666, L. S. Jr. Univ. Mus., collected by E. C. Starks in Elliot Bay, near Seattle, Washington.

PLATE CCCXXIX.

794. **Evermannia zosterura** (Jordan and Gilbert) 2256
Drawing by Anna L. Brown from No. 2927, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

795. **Typhlogobius californiensis** Steindachner 2262
Drawing by A. H. Baldwin from No. 34747, U.S.N.M., collected by Rosa Smith at San Diego, California.

796. **Echeneis naucrates** Linnæus 2269
Drawing by H. L. Todd.

PLATE CCCXXX.

Text page.

797, 797*a*. **Remora brachyptera** (Lowe) 2272
Drawing by H. L. Todd from No. 23374, U.S.N.M., collected by Daniel McEachran in N. lat. 42° 40′, W. long. 63° 6′, in 250 fathoms.

798. **Rhombochirus osteochir** (Cuvier) 2273
Drawing by H. L. Todd from No. 19022, U.S.N.M., collected by the U. S. Fish Commission at Woods Hole, Massachusetts.

799. **Caulolatilus microps** Goode and Bean 2277
Drawing by H. L. Todd from No. 20971, U.S.N.M., collected by Silas Stearns at the Pensacola Snapper Banks.

PLATE CCCXXXI.

800. **Opisthognathus macrognathum** Poey 2281
Drawing by H. L. Todd from No. 5936, U.S.N.M., the type of *O. scaphiurus* Goode and Bean, collected by Dr. Whitehurst at Garden Key, Florida.

800*a*. **Opisthognathus macrognathum** Poey 2281
Drawing by A. H. Baldwin from No. 5936, U.S.N.M., the type of *O. scaphiurus* Goode and Bean, collected by Dr. Whitehurst at Garden Key, Florida.

801. **Gnathypops maxillosa** Poey 2284
Drawing by H. L. Todd from No. 5866, U.S.N.M., collected at Garden Key, Florida.

PLATE CCCXXXII.

802. **Bathymaster signatus** Cope 2288
Drawing by H. L. Todd from No. 27646, U.S.N.M., collected by Capt. E. P. Herendeen at the Shumagin Islands, Alaska.

803. **Ronquilus jordani** (Gilbert) 2289
Drawing by Anna L. Brown from No. 3410, L. S. Jr. Univ. Mus., collected by the Young Naturalist Society of Seattle in Elliot Bay, near Seattle, Washington.

804. **Chiasmodon niger** Johnson 2291
Drawing by H. L. Todd from No. 25633, U.S.N.M., collected by Capt. Thomas F. Hodgdon at the surface on Le Have Bank.

PLATE CCCXXXIII.

805. **Hypsicometes gobioides** Goode 2294
Drawing by A. H. Baldwin from a specimen collected by the *Albatross* at Station 2377.

806. **Trichodon trichodon** (Tilesius) 2295
Drawing by M. M. Smith from No. 27980, U.S.N.M., collected by Marcus Baker at the Shumagin Islands.

807. **Arctoscopus japonicus** (Steindachner) 2297
Drawing by W. S. Atkinson from No. 5656, L. S. Jr. Univ. Mus., collected by the *Albatross* at Station 3652.

PLATE CCCXXXIV.

Text page.

808. **Astroscopus y-græcum** (Cuvier and Valenciennes) 2307
Drawing by M. M. Smith from No. 18029, U.S.N.M., collected by J. C. Willets at Matanzas River Inlet, Florida.

809, 809*a*. **Kathetostoma albigutta** Bean 2312
Drawings by M. M. Smith from No. 2403, U.S.N.M., collected by the *Albatross*.

PLATE CCCXXXV.

810. **Opsanus pardus** (Goode and Bean) 2316
Drawing by H. L. Todd from the type, No. 22237, U.S.N.M., collected by Silas Stearns at the Pensacola Snapper Banks, Florida.

811. **Porichthys porosissimus** (Cuvier and Valenciennes)..... 2319
Drawing by A. H. Baldwin from a specimen collected by the *Albatross* at Station 2121.

812. **Caularchus mæandricus** (Girard) 2328
Drawing by H. L. Todd.

813. **Rimicola muscarum** (Meek and Pierson)..... 2338
Drawing by A. H. Baldwin from the type in L. S. Jr. Univ. Mus., collected by Meek and Pierson in Monterey Bay, California.

PLATE CCCXXXVI.

814. **Enneanectes carminalis** (Jordan and Gilbert) 2350
Drawing by Anna L. Brown from No. 3854, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

815. **Gibbonsia elegans evides** (Jordan and Gilbert)..... 2352
Drawing by A. H. Baldwin from No. 34784, U.S.N.M., collected by Rosa Smith at San Diego, California.

816. **Neoclinus satiricus** Girard 2355
Drawing by W. S. Atkinson from No. 2288, L. S. Jr. Univ. Mus., collected by Dr. Gilbert at Pacific Grove, California.

PLATE CCCXXXVII.

817. **Cryptotrema corallinum** Gilbert 2266
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

818. **Exerpes asper** (Jenkins and Evermann) 2367
Drawing by A. H. Baldwin from the type, No. 39643, U.S.N.M., collected by Jenkins and Evermann at Guaymas, Mexico.

819. **Auchenopterus nox** (Jordan and Gilbert) 2373
Drawing by Anna L. Brown from the type collected by Dr. Jordan at Key West, Florida.

PLATE CCCXXXVIII.

Text page.

820. **Blennius favosus** Goode and Bean 2380
Drawing from the type, No. 2629, U.S.N.M., collected by G. Würdemann at Garden Key, Florida.

821. **Blennius cristatus** Linnæus 2382

822. **Hypsoblennius ionthas** (Jordan and Gilbert) 2388

PLATE CCCXXXIX.

823. **Hypsoblennius hentz** (Le Sueur) 2390
Drawing by M. M. Smith from No. 26308, U.S.N.M., collected at Charleston, South Carolina, by C. C. Leslie.

824. **Chasmodes saburræ** Jordan and Gilbert 2392
Drawing by H. L. Todd from the type, No. 30824, U.S.N.M., collected by Jordan and Stearns at Pensacola, Florida.

825. **Rupiscartes atlanticus** (Cuvier and Valenciennes) 2397
Drawing by A. H. Baldwin from No. 36946, U.S.N.M., collected by C. H. Townsend at San Cristobal, Lower California.

PLATE CCCXL.

826. **Emblemaria atlantica** Jordan and Evermann 2402
Drawing by A. H. Baldwin from the type, No. 33915, U.S.N.M., collected by Silas Stearns at the Pensacola Snapper Banks, Florida.

827. **Stathmonotus hemphillii** Bean 2407
Drawing by H. L. Todd from the type, No. 37193, U.S.N.M., collected by Henry Hemphill at Key West, Florida.

PLATE CCCXLI.

828. **Bryostema polyactocephalum** (Pallas) 2408
Drawing by H. L. Todd from No. 36889, U.S.N.M., collected by J. G. Swan in Puget Sound, Washington.

829. **Bryostema nugator** Jordan and Williams 2410
Drawing by Anna L. Brown from the type, No. 3134, L. S. Jr. Univ. Mus., collected by the Young Nat. Soc. of Seattle in Elliot Bay, near Seattle, Washington.

830. **Apodichthys flavidus** Girard 2411
Drawing by W. S. Haines from No. 36965, U.S.N.M., collected by J. G. Swan at Port Townsend, Washington.

PLATE CCCXLII.

831. **Pholis dolichogaster** (Pallas) 2416
Drawing by H. L. Todd from No. 33834, U.S.N.M., collected by Dr. L. Stejneger at Bering Island.

832. **Pholis gunnellus** (Linnæus) 2419
Drawing by H. L. Todd from No. 23198, U.S.N.M, collected by R. E. Earll at Gloucester, Massachusetts.

Text page.

833. **Pholis ornatus** (Girard) 2419
Drawing by M. M. Smith from No. 27996, U.S.N.M., collected by Dr. Bean at Sitka, Alaska.

PLATE CCCXLIII.

834. **Asternopteryx gunnelliformis** Rüppell..... 2420
Drawing by A. H. Baldwin from No. 48453, U.S.N.M., collected by Schuchert and White in Omanak Fjord, Karsak, Noursook Peninsula, Greenland.

835. **Anoplarchus atropurpureus** (Kittlitz) 2422
Drawing by H. L. Todd from No. 29820, U.S.N.M., collected by L. M. Turner at Atka Island, Alaska.

836. **Xiphistes ulvæ** Jordan and Starks..... 2423
Drawing by Anna L. Brown from the type, No. 3132 L. S. Jr. Univ. Mus., collected by E. C. Starks at Waadda Island, Neah Bay, Washington.

PLATE CCCXLIV.

837. **Xiphistes chirus** (Jordan and Gilbert)..... 2424
Drawing by H. L. Todd from No. 23964, U.S.N.M, collected by W. H. Dall at Amchitka Island, Alaska.

838. **Xiphidion rupestre** (Jordan and Gilbert)..... 2426
Drawing by H. L. Todd from a specimen collected by Sylvanus Bailey at Sitka, Alaska.

839. **Lumpenus mackayi** Gilbert..... 2436
Drawing by A. H. Baldwin from the type collected in the Nushagak River, Alaska, by the *Albatross*.

840. **Lumpenus lampetræformis** (Walbaum)..... 2438
Drawing by H. L. Todd from No. 13852, U.S.N.M.

PLATE CCCXLV.

841. **Stichæus punctatus** (Fabricius) 2439
Drawing by H. L. Todd from No. 21718, U.S.N.M., collected by L. M. Turner at St. Michaels, Alaska.

842. **Ulvaria subbifurcata** (Storer) 2440
Drawing by H. L. Todd from a specimen from the Academy of Natural Sciences of Montreal.

843. **Cryptacanthodes maculatus** Storer..... 2443
Drawing by H. L. Todd from No. 22309, U.S.N.M, obtained from E. G. Blackford.

PLATE CCCXLVI.

844. **Lyconectes aleutensis** Gilbert..... 2444
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3312, north of Unalaska, in 45 fathoms.

845. **Anarhichas latifrons** Steenstrup and Hallgrimsson..... 2446
Drawing by H. L. Todd from No. 21373, U.S.N.M., collected by Capt. J. W. Collins in N. lat. 43° 56′, W. long. 59° 04′.

PLATE CCCXLVII.

Text page.

846. **Anarhichas lupus** Linnæus 2446
Drawing by H. L. Todd from No. 21846, U.S.N.M., collected by Capt. John Gourville at Georges Bank.

847. **Anarhichas lepturus** Bean 2447
Drawing from the type, collected by L. M. Turner at St. Michaels, Alaska.

848. **Ptilichthys goodei** Bean 2452
Drawing by H. L. Todd from the type, No. 26619, U.S.N.M., collected at Iliuliuk (Unalaska), Alaska.

PLATE CCCXLVIII.

849, 849*a*, 849*b*. **Scytalina cerdale** Jordan and Gilbert 2454
Drawings by Anna L. Brown from No. 3389, L. S. Jr. Univ. Mus., collected by E. C. Starks at Waadda Island, Neah Bay, Washington.

850. **Zoarces anguillaris** (Peck) 2457
Drawing by H. L. Todd from No. 10438, U.S.N.M., collected by the U. S. Fish Commission at Eastport, Maine.

851. **Embryx crotalinus** (Gilbert) 2458
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 2980, off Santa Barbara Islands.

PLATE CCCXLIX.

852. **Aprodon cortezianus** Gilbert 2461
Drawing by A. H. Baldwin from the type, No. 46457, U.S.N.M., collected by the *Albatross* on Cortez Banks, off San Diego, California.

853. **Lycodes zoarchus** Goode and Bean 2464
Drawing by H. L. Todd from the type, No. 39298, U.S.N.M., collected by the *Albatross* in N. lat. 44° 46′ 30″, W. long. 59° 55′ 45″, off Nova Scotia, in 130 fathoms.

854. **Lycodes reticulatus** Reinhardt 2465
Drawing by H. L. Todd from a specimen collected by Capt. R. Markuson at S. W. Banquereau, in 300 fathoms.

PLATE CCCL.

855. **Lycodes perspicillum** Kröyer 2465
Drawing by H. L. Todd from No. 39336, U.S.N.M., collected by the *Albatross* at Station 2456, in N. lat. 47° 29′, W. long. 52° 18′, in 86 fathoms.

856. **Lycodes frigidus** Collett 2465
Drawing by H. L. Todd from No. 32995, U.S.N.M., collected by the *Albatross* at Station 2018, in N. lat. 37° 12′ 22″, W. long. 74° 20′ 04″, in 788 fathoms.

Text page.

857. **Lycodalepis polaris** (Sabine)..... 2468
Drawing by H. L. Todd from No. 27748, U.S.N.M., the type of *Lycodes coccineus* Bean, collected by Dr. Bean at Big Diomede Island, Bering Strait.

858. **Lycodalepis turneri** (Bean)..... 2469
Drawing by H. L. Todd from the type, No. 21529, U.S.N.M., collected by L. M. Turner at St. Michaels, Alaska.

PLATE CCCLI.

859. **Lycenchelys verrillii** (Goode and Bean)..... 2470
Drawing by H. L. Todd from No. 21015, U.S.N.M., an old male, collected by the U. S. Fish Commission, 27 miles southwest of Chebucto, Nova Scotia.

860, 860*a*, 860*b*, 860*c*. 860*d*. **Lycenchelys paxillus** (Goode and Bean). 2471
Drawings by H. L. Todd from the type, No. 22177, U.S.N.M., collected by Capt. J. W. Collins in N. lat. 42° 48′, W. long. 63° 07′.

861. **Furcimanus diapterus** (Gilbert)..... 2472
Drawing by W. S. Atkinson from a specimen in L. S. Jr. Univ. Mus.

PLATE CCCLII.

862. **Lycodonus mirabilis** (Goode and Bean)..... 2474
Drawing by S. F. Denton from No. 39207, U.S.N.M., collected by the *Albatross* at Station 2742, in N. lat. 37° 46′ 30″, W. long. 73° 56′ 30″.

863. **Lyconema barbatum** Gilbert..... 2474
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3129, in 204 fathoms.

864, 864*a*, 864*b*, 864*c*. **Gymnelis viridis** (Fabricius)..... 2479
Drawing by H. L. Todd from No. 21999a, U.S.N.M., collected at Niantilik Harbor, Cumberland Gulf, by W. A. Mintzer.

865. **Melanostigma pammelas** Gilbert..... 2479
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3202, on coast of California.

PLATE CCCLIII.

866. **Lepophidium marmoratum** (Goode and Bean)..... 2482
Drawing by M. M. Hildebrant from the type, No. 37237, U.S.N.M., collected by the *Albatross* in N. lat. 23° 10′ 39″, W. long. 82° 20′ 21″, in 213 fathoms.

867. **Lepophidium profundorum** (Gill)..... 2484
Drawing by A. H. Baldwin from a specimen collected by the *Albatross* at Station 2042.

868. **Rissola marginata** (De Kay)..... 2489

PLATE CCCLIV.

Text page.

869. **Otophidium omostigmum** (Jordan and Gilbert) 2490
Drawing by H. L. Todd from the type, No. 29670, U.S.N.M., collected by Jordan and Stearns at the Pensacola Snapper Banks.

870. **Lycodapus dermatinus** Gilbert 2492
Drawing by A. H. Baldwin from the type, collected by the *Albatross* at Station 3162, off Lower California.

871. **Brotula barbata** (Bloch and Schneider) 2500
Drawing by A. H. Baldwin from No. 5337, U.S.N.M., collected by Professor Poey in Cuba.

PLATE CCCLV.

872. **Ogilbia ventralis** (Gill) 2503
Drawing by Anna L. Brown from No. 2903, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

873. **Ogilbia cayorum** Evermann and Kendall 2503
Drawing by A. H. Baldwin from the type, No. 48792, U.S.N.M., collected by Evermann and Kendall at Key West, Florida.

874. **Dicromita agassizii** Goode and Bean 2506
Drawing by H. L. Todd from the type, collected by the *Blake* off Grenada.

PLATE CCCLVI.

875. **Bassozetus normalis** Gill 2507
Drawing by H. L. Todd from No. 39416, U.S.N.M., collected by the *Albatross* in N. lat. 28° 02′ 30″, W. long. 87° 43′ 45″.

876. **Bassozetus catena** Goode and Bean 2509
Drawn by A. H. Baldwin from the type, No. 37341, U.S.N.M., collected by the *Albatross* in N. lat. 28° 00′ 15″, W. long. 87° 42′, in 1,467 fathoms.

876*a*. **Bassozetus catena** Goode and Bean 2509
Drawn by H. L. Todd from same specimen.

PLATE CCCLVII.

877. **Neobythites gillii** Goode and Bean 2512
Drawing by A. H. Baldwin from the type, No. 37340, U.S.N.M., collected by the *Albatross* in N. lat. 28° 33′, W. long. 85° 33′, in 111 fathoms.

878. **Neobythites marginatus** Goode and Bean 2513
Drawing by H. L. Todd from the type collected by the *Blake* off Barbados, in 209 fathoms.

879. **Bassogigas gillii** Goode and Bean 2515
Drawing by A. H. Baldwin from the type, No. 39417, U.S.N.M., collected by the *Albatross* off Cape Henlopen, Delaware, in N. lat. 39° 35′, W. long. 70° 54′, in 1,106 fathoms.

880. **Barathrodemus manatinus** Goode and Bean 2517
Drawing by H. L. Todd from the type in M. C. Z., collected by the *Blake* in N. lat. 33° 35′ 20″, W. long. 76°, in 647 fathoms.

PLATE CCCLVIII.

Text page.

881. **Porogadus miles** Goode and Bean 2520
Drawing by A. H. Baldwin from the type, No. 35625, U.S.N.M., collected by the *Albatross* at Station 2230, in N. lat. 38° 27′, W. long. 73° 02′, in 1,168 fathoms.

882. **Dicrolene intronigra** Goode and Bean 2522
Drawing by H. L. Todd from a specimen collected by the *Blake* in the Gulf Stream.

883. **Barathronus bicolor** Goode and Bean 2524
Drawing by M. M. Smith from the type collected by the *Blake* at Station LXXI, off Guadeloupe, in 769 fathoms.

PLATE CCCLIX.

884. **Merluccius productus** (Ayres) 2531
Drawing by H. L. Todd from No. 26638, U.S.N.M., collected by W. F. Prosser at Seattle, Washington.

885. **Borogadus saida** (Lepechin) 2533
Drawing by H. L. Todd from No. 24031, U.S.N.M., collected by L. M. Turner at St. Michaels, Alaska.

886. **Pollachius virens** (Linnæus) 2534
Drawing by H. L. Todd from No. 10443, U.S.N.M., collected by Professor Baird at Eastport, Maine.

PLATE CCCLX.

887. **Theragra chalcogramma** (Pallas) 2535
Drawing by H. L. Todd from No. 27637, U.S.N.M., collected by W. H. Dall in Pirate Cove, Shumagin Island, Alaska.

888. **Eleginus navaga** (Kölreuter) 2537
Drawing by H. L. Todd from No. 9286, U.S.N.M., collected by H. Bannister at St. Michaels, Alaska.

889. **Microgadus proximus** (Girard) 2539
Drawing by H. L. Todd from No. 27982, U.S.N.M., collected at Yakutat Bay, Alaska, by Dr. T. H. Bean.

890. **Microgadus tomcod** (Walbaum) 2540
Drawing by H. L. Todd from No. 17733, U.S.N.M., collected by V. N. Edwards at Woods Hole, Massachusetts.

PLATE CCCLXI.

891. **Gadus callarias** Linnæus 2541
Drawing by H. L. Todd from No. 10444, U.S.N.M., collected by Professor Baird at Eastport, Maine.

892. **Melanogrammus æglefinus** Linnæus 2542
Drawing by H. L. Todd from No. 10440, U.S.N.M., collected by Professor Baird at Eastport, Maine.

892*a*. **Melanogrammus æglefinus** Linnæus 2542
Drawing of skull by H. L. Todd.

PLATE CCCLXII.

Text page.

893, 893*a*. **Antimora viola** (Goode and Bean) 2544
Drawings by H. L. Todd from the type, No. 21837, U.S.N.M., collected by Capt. J. W. Collins on Le Have Bank, in 400 to 500 fathoms.

894. **Uraleptus malardi** (Risso) 2545
Drawing by H. L. Todd from a specimen collected by the *Blake* at Station LXXXI, off Neris.

PLATE CCCLXIII.

895. **Lotella maxillaris** Bean 2546
Drawing by H. L. Todd from the type, No. 29832, U.S.N.M., collected by the *Fish Hawk* in N. lat. 39° 55′, W. long. 70° 28′, in 396 fathoms.

896. **Physiculus fulvus** Bean 2547
Drawing by H. L. Todd from the type, No. 28466, U.S.N.M., collected by the *Fish Hawk* in N. lat. 40° 01′, W. long. 69° 56′, in 79 fathoms.

PLATE CCCLXIV.

897. **Lota maculosa** (Le Sueur) 2550
Drawing by H. L. Todd.

898. **Urophycis regius** (Walbaum) 2553
Drawing by H. L. Todd from No. 20923, U.S.N.M., obtained by E. G. Blackford from the New York Aquarium.

899. **Urophycis cirratus** (Goode and Bean) 2553
Drawing by H. L. Todd from the type, No. 39059, U.S.N.M., collected by the *Albatross* at Station 2376, in N. lat. 29° 03′ 15″, W. long. 88° 16′.

PLATE CCCLXV.

900. **Urophycis earlli** (Bean) 2554
Drawing by H. L. Todd from the type, No. 25207, U.S.N.M., collected by R. E. Earll at Charleston, South Carolina.

901. **Urophycis tenuis** (Mitchill) 2555
Drawing by H. L. Todd from No. 21029, U.S.N.M., collected by the *Speedwell* in Halifax Harbor.

902. **Urophycis chuss** (Walbaum) 2555
Drawing by H. L. Todd from No. 28707, U.S.N.M., collected by the *Fish Hawk* at Station 918, in N. lat. 40° 20′ 24″, W. long. 70° 41′ 30″, in 245 fathoms.

PLATE CCCLXVI.

903. **Urophycis chesteri** Goode and Bean 2556
Drawing by H. L. Todd from No. 21840, U.S.N.M., collected by the *Speedwell* at Station 174, off Cape Ann, in 140 fathoms.

Text page.

904. **Lemonema barbatulum** Goode and Bean 2556
Drawing by W. S. Haines from No. 38331, U.S.N.M., collected by the *Albatross* at Station 2397 in N. lat. 28° 42′, W. long. 86° 36′, in 280 fathoms.

905. **Lemonema melanurum** Goode and Bean 2557
Drawing by W. S. Haines from the type, No. 38270, U.S.N.M., collected by the *Albatross* at Station 2415 in N. lat. 30° 44′, W. long. 79° 26′, in 440 fathoms.

PLATE CCCLXVII.

906. **Gairdropsarus argentatus** (Rheinhardt) 2559
Drawing by H. L. Todd from No. 7212, U.S.N.M., collected at Nahant, Massachusetts, by F. W. Putnam.

907. **Euchelyopus cimbrius** (Linnæus) 2560
Drawing by H. L. Todd from No. 21721, U.S.N.M., collected by Edward Brown in Bay Chaleur.

908. **Bathygadus favosus** Goode and Bean 2565
Drawing by H. L. Todd from the type collected by the *Blake* off Martinique, in 472 fathoms.

PLATE CCCLXVIII.

909. **Steindachneria argentea** Goode and Bean 2568
Drawing by H. L. Todd from the type, No. 37350, U.S.N.M., collected by the *Albatross* in N. lat. 39° 14′ 30″, W. long. 88° 9′ 30″, in 68 fathoms.

910. **Chalinura simula** Goode and Bean 2578
Drawing by H. L. Todd from No. 39152, U.S.N.M., collected by the *Albatross* at Station 2095 in N. lat. 39° 29′, W. long. 70° 58′ 40″, in 1,342 fathoms.

911. **Coryphænoides carapinus** Goode and Bean 2579
Drawing by H. L. Todd from a specimen collected by the *Blake* in N. lat. 39° 43′, W. long. 70° 55′ 25″.

PLATE CCCLXIX.

912. **Hymenocephalus cavernosus** (Goode and Bean) 2580
Drawing by S. F. Denton from the type, No. 37337, U.S.N.M., collected by the *Albatross* at Station 2398 in N. lat. 28° 45′ W. long. 86° 26′, in 227 fathoms.

913. **Cœlorhynchus occa** (Goode and Bean) 2588
Drawing by H. L. Todd from the type No. 37334, U.S.N.M., collected by the *Albatross* at Station 2396 in N. lat. 28° 34′, W. long. 86° 48′, in 335 fathoms.

914. **Cœlorhynchus carminatus** (Goode) 2588
Drawing by H. L. Todd from No. 26187, U.S.N.M., collected by the *Fish Hawk* at Station 893, off Marthas Vineyard, in 372 fathoms.

PLATE CCCLXX.

Text page.

915. **Cœlorhynchus caribbæus** (Goode and Bean)..... 2589
Drawing by H. L. Todd from the type, No. 37333, U.S.N.M., collected by the *Albatross* at Station 2377, in the northern part of the Gulf of Mexico, in N. lat. 29° 7′ 30″, W. long. 88° 8′, in 210 fathoms.

916. **Regalecus glesne** (Ascanius)..... 2596
Drawing from Day, Fishes of Great Britain and Ireland, pl. 64.

PLATE CCCLXXI.

917. **Atheresthes stomias** (Jordan and Gilbert)..... 2609
Drawing by A. H. Baldwin from No. 27186, U.S.N.M., collected by Dr. Jordan at Point Reyes, California.

918. **Hippoglossus hippoglossus** (Linnæus)..... 2611
Drawing by H. L. Todd from No. 27605, U.S.N.M., collected at Marmot Island, Alaska, by Dr. Bean.

PLATE CCCLXXII.

919. **Hippoglossoides platessoides** (Fabricius)..... 2614
Drawing by H. L. Todd from No. 21002, U.S.N.M., collected at Le Have Bank.

920. **Hippoglossoides elassodon** Jordan and Gilbert..... 2615

PLATE CCCLXXIII.

921. **Psettichthys melanostictus** Girard..... 2618
Drawing by H. L. Todd from No. 24167, U.S.N.M., collected at San Francisco, California, by Dr. Jordan.

922. **Paralichthys dentatus** (Linnæus)..... 2629
Drawing by A. H. Baldwin from a specimen collected by Dr. H. M. Smith at St. George Island, Maryland.

PLATE CCCLXXIV.

923. **Paralichthys squamilentus** Jordan and Gilbert..... 2631
Drawing by H. L. Todd from No. 30862, U.S.N.M., collected at Pensacola, Florida, by Jordan and Stearns.

924. **Paralichthys oblongus** (Mitchill)..... 2632
Drawing by H. L. Todd.

PLATE CCCLXXV.

925. **Ancylopsetta quadrocellata** Gill..... 2634

926. **Pleuronichthys decurrens** Jordan and Gilbert..... 2637
Drawing by A. H. Baldwin from No. 27115, U.S.N.M., collected by Dr. Jordan at San Francisco, California.

PLATE CCCLXXVI.

Text page.

927. **Inopsetta ischyra** (Jordan and Gilbert) 2641
Drawing by H. L. Todd from No. 32913, U.S.N.M., collected at Unalaska by E. W. Nelson.

928. **Lepidopsetta bilineata** (Ayres) 2643
Drawing from No. 27602, U.S.N.M., collected by Dr. Bean at St. Paul, Kadiak Island, Alaska.

PLATE CCCLXXVII.

929. **Limanda ferruginea** (Storer) 2644
Drawing by H. L. Todd from No. 21903, U.S.N.M., collected at Gloucester, Massachusetts, by the U. S. Fish Commission.

930. **Limanda aspera** (Pallas) 2645
Drawing from No. 27944, U.S.N.M., collected by Dr. Bean at Sitka, Alaska.

PLATE CCCLXXVIII.

931. **Limanda proboscidea** Gilbert 2645
Drawing by A. H. Baldwin from the type, collected by the *Albatross* in Bristol Bay, Alaska.

932. **Limanda beanii** Goode 2646
Drawing by H. L. Todd from the type, No. 26102, U.S.N.M., collected by the *Fish Hawk* at Station 875, off the south coast of New England.

PLATE CCCLXXIX.

933. **Pseudopleuronectes americanus** (Walbaum) 2647
Drawing by H. L. Todd from a specimen in the U.S.N.M.

934. **Pleuronectes quadrituberculatus** Pallas 2648
Drawing by H. L. Todd from No. 28025, U.S.N.M., collected at St. Paul, Kadiak, by W. J. Fischer.

PLATE CCCLXXX.

935. **Liopsetta glacialis** (Pallas) 2649
Drawing by H. L. Todd from No. 27947, U.S.N.M., collected in Kotzebue Sound by Dall and Bean.

936. **Liopsetta putnami** (Gill) 2650
Drawing by H. L. Todd from No. 5368, U.S.N.M., collected at Salem, Massachusetts, by F. W. Putnam.

PLATE CCCLXXXI.

937, 937*a*. **Platichthys stellatus** (Pallas) 2652
Drawing by H. L. Todd from No. 27640, U.S.N.M., collected by Dr. Bean in Alaska.

PLATE CCCLXXXII.

Text page.

938. **Lophopsetta maculata** (Mitchill) 2660
Drawing by H. L. Todd.

939. **Platophrys ocellatus** (Agassiz) 2663
Drawing by H. L. Todd from No. 34972, U.S.N.M., type of *P. nebularis* Jordan and Gilbert, collected by Dr. Jordan at Key West, Florida.

PLATE CCCLXXXIII.

940. **Trichopsetta ventralis** (Goode and Bean) 2669
Drawing by H. L. Todd from No. 37372, U.S.N.M., collected by the *Albatross* at Station 2378, in N. lat. 29° 14′ 30″, W. long. 88° 09′ 30″, in 68 fathoms.

941. **Syacium papillosum** (Linnæus) 2671
Drawing by H. L. Todd from the type of *Hemirhombus pœtulus* Bean, No. 30180, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

PLATE CCCLXXXIV.

942. **Azevia panamensis** (Steindachner) 2677
Drawing by A. H. Baldwin from No. 15, Mus. Comp. Zool.

943. **Citharichthys sordidus** (Girard) 2679
Drawing by H. L. Todd from No. 31991, U.S.N.M., collected by Capt. H. E. Nichols in Johnstons Straits, British Columbia.

PLATE CCCLXXXV.

944. **Citharichthys macrops** Dresel 2684
Drawing by H. L. Todd from the type, No. 21500, U.S.N.M., collected by Silas Stearns at Pensacola, Florida.

945. **Etropus rimosus** Goode and Bean 2688
Drawing by H. L. Todd from the type, collected by the *Albatross* at Station 2408, in N. lat. 28° 28′, W. long. 84° 25′, in 21 fathoms.

PLATE CCCLXXXVI.

946. **Etropus crossotus** Jordan and Gilbert 2689
Drawing by H. L. Todd from No. 26571, U.S.N.M., collected by Silas Stearns at Cedar Keys, Florida.

947. **Achirus lineatus** (Linnæus) 2697
Drawing by H. L. Todd.

PLATE CCCLXXXVII.

948. **Achirus fasciatus** Lacépède 2700
Drawing by H. L. Todd.

949. **Symphurus marginatus** (Goode and Bean) 2706
Drawing by H. L. Todd from a specimen collected by the *Albatross* at Station 2376, in N. lat 29° 03′ 15″, W. long. 88° 16′, in 324 fathoms.

PLATE CCCLXXXVIII.

Text page.

950. **Symphurus plagiusa** (Linnæus) 2710
Drawing by H. L. Todd from No. 15017, U.S.N.M., collected by Dr. H. C. Yarrow at Beaufort, North Carolina.

951. **Symphurus williamsi** Jordan and Culver 2711
Drawing by Anna L. Brown from the type, No. 2943, L. S. Jr. Univ. Mus., collected by the Hopkins Expedition at Mazatlan, Mexico.

952. **Lophius piscatorius** Linnæus 2713
Drawing by H. L. Todd from a specimen in the U.S.N.M.

PLATE CCCLXXXIX.

953. **Chaunax pictus** Lowe 2726
Drawing by H. L. Todd from No. 26021, U.S.N.M., collected by the *Albatross* at Station 869.

954. **Ceratias holbolli** Kröyer 2729
Drawing by A. H. Baldwin from Gaimard, Voy. Skand., Poissons, pl. IX.

PLATE CCCXC.

955. **Mancalias shufeldti** (Gill) 2730
Drawing by H. L. Todd from the type, No. 33552, U.S.N.M., collected by the *Albatross* at Station 2099, in N. lat. 37° 12′ 20″, W. long. 69° 39′, in 2,949 fathoms.

956. **Cryptopsaras couesii** Gill 2731
Drawing by H. L. Todd from No. 33558, U.S.N.M., collected by the *Albatross* at Station 2101, in N. lat. 38° 13′ 30″, W. long. 68° 24′, in 1,686 fathoms.

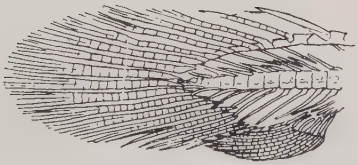
PLATE CCCXCI.

957. **Caulophryne jordani** Goode and Bean 2735
Drawing by S. F. Denton from the type, No. 39265, U.S.N.M., collected by the *Albatross* in N. lat. 39° 27′, W. long. 71° 15′, in 1,276 fathoms.

PLATE CCCXCII.

958, 958*a*, 958*b*. **Ogcocephalus vespertilio** (Linnæus) 2737
Drawing by H. L. Todd from No. 2316, U.S.N.M., collected by the *Albatross* in N. lat. 24° 25′ 30″, W. long. 81° 47′ 45″.

1



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1. Branchiostoma caribæum. (P. 3.)
2. Tail of Polypterus bichir.
3. Petromyzon marinus. (P. 10.)
4. Entosphenus tridentatus. (P. 12.)

5

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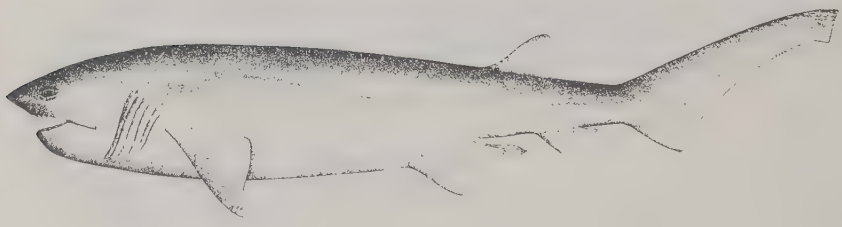

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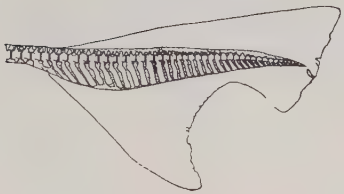
5. LAMPETRA AUREA. (P. 13.)
6. LAMPETRA SPADICEA. (P. 13.)
7. NOTORHYNCHUS MACULATUS. (P. 17.)
8. HEXANCHUS GRISEUS. (P. 19.)

9



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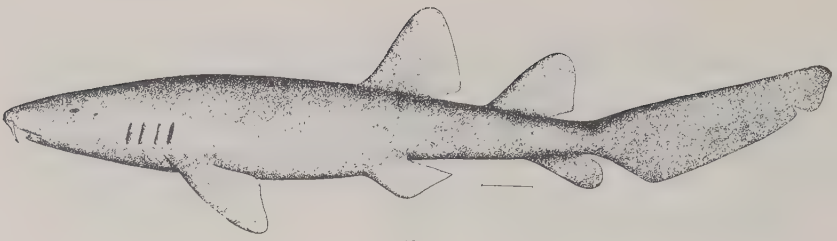
11

12

9. Gyropleurodus francisci. (P. 20.)
10. Heterocercal tail of Heterodontus philippii.
11. Scylliorhinus profundorum. (P. 22.)
12. Catulus uter. (P. 25.)



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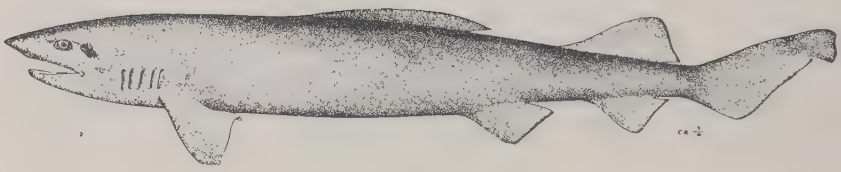

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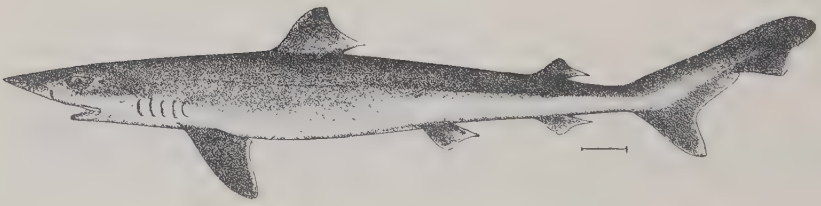
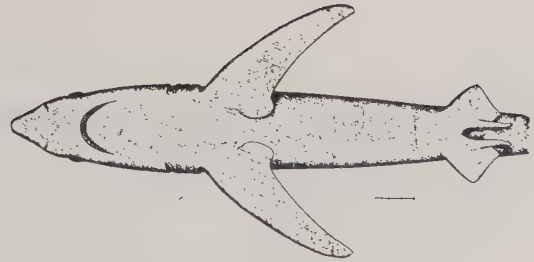


15

16

13. Ginglymostoma cirratum. (P. 26.)
14. Pseudotriakis microdon. (P. 27.)
15. Galeorhinus zyopterus. (P. 22.)
16. Prionace glauca. (P. 33.)



16*a*

17

18

19

16*a*. PRIONACE GLAUCA. (P. 33.)
17. CARCHARHINUS LAMIA. (P. 38.)
18. HYPOPRION BREVIROSTRIS. (P. 41.)
19. SPHYRNA TIBURO. (P. 44.)

20

21

22

20. ALOPIAS VULPES. (P. 45.)
21. ISURUS DEKAYI. (P. 48.)
22. LAMNA CORNUBICA. (P. 49.)

23

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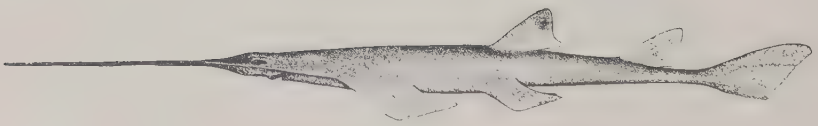
24*a*

23. CETORHINUS MAXIMUS. (P. 51.)
24, 24*a*. SQUALUS ACANTHIAS. (P. 54.)

25

26



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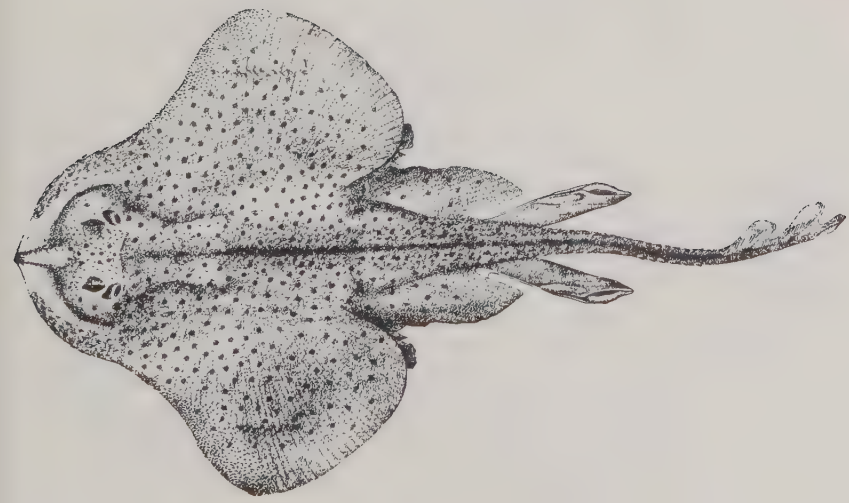
28

25. CENTROSCYMNUS CŒLOLEPIS. (P. 55.)
26. CENTROSCYLLIUM FABRICII. (P. 56.)
27. PRISTIS PECTINATUS. (P. 60.)
28. RHINOBATUS LENTIGINOSUS. (P. 62.)

28*a*

28*b*



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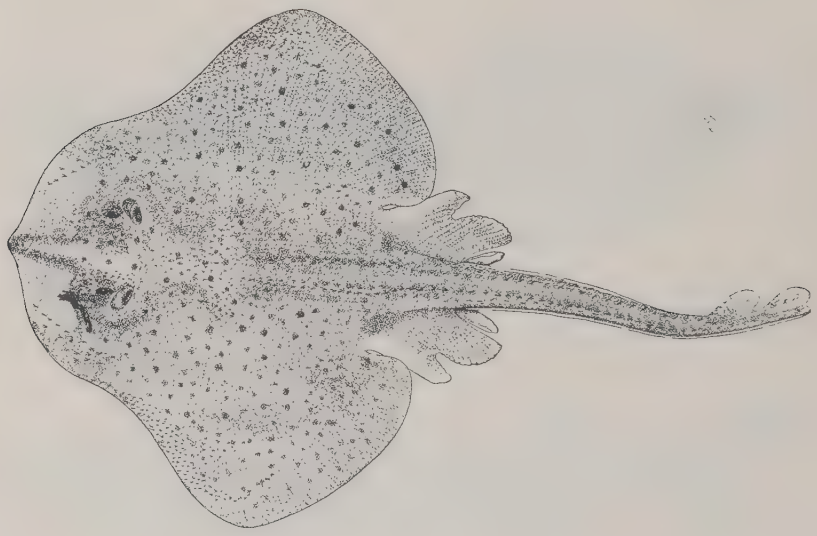
28*a*, 28*b*. RHINOBATUS LENTIGINOSUS. (P. 62.)
29. RAJA ERINACEA. (P. 68.)



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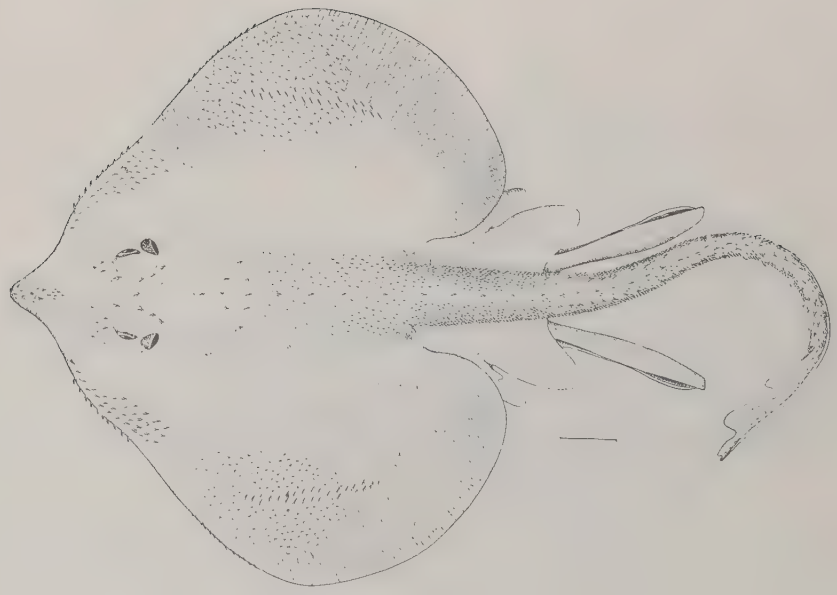

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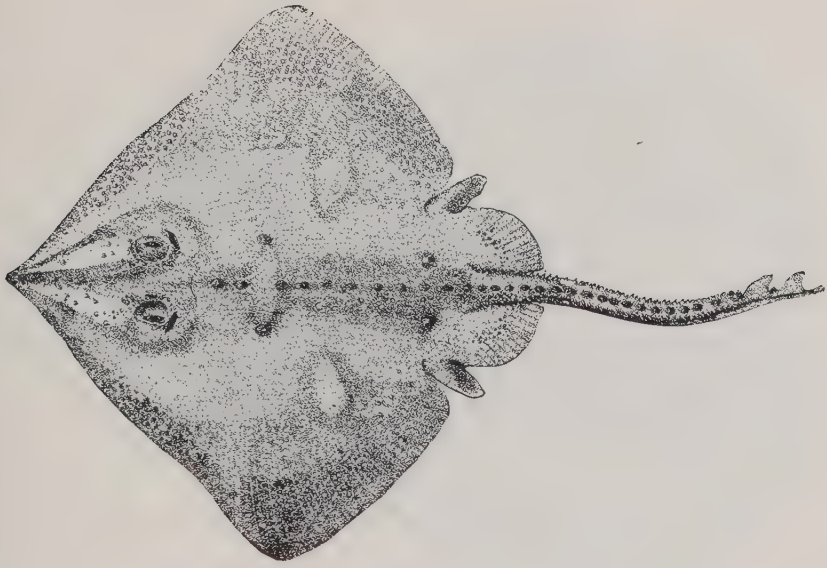
30. RAJA OCELLATA. (P. 68.)
31. RAJA ACKLEYI. (P. 70.)



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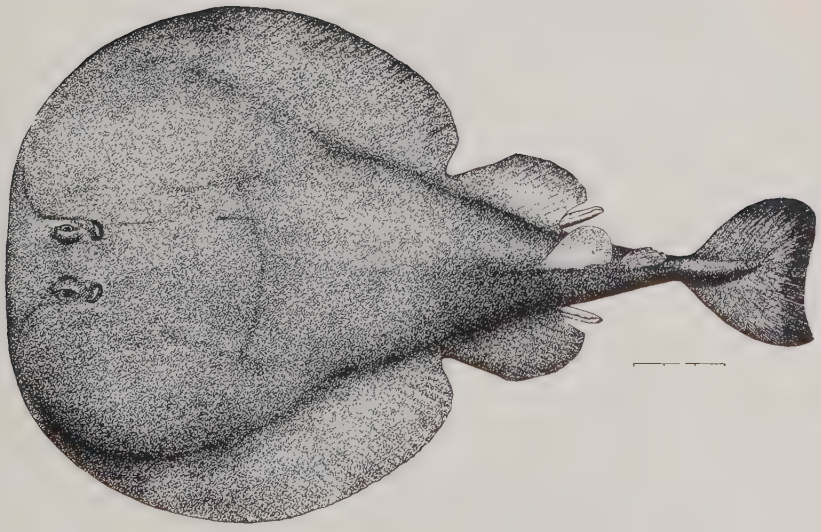

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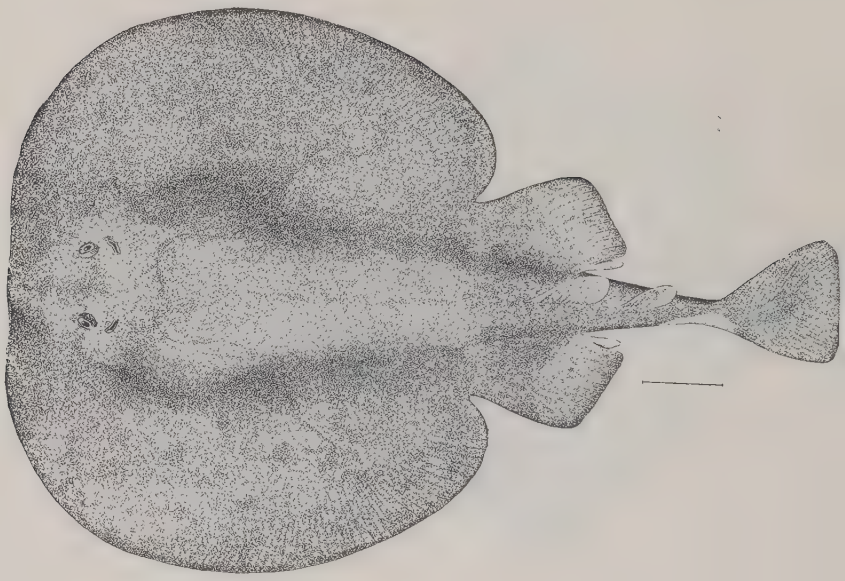
32. Raja stellulata. (P. 75.)
33. Tetronarce occidentalis. (P. 77.)



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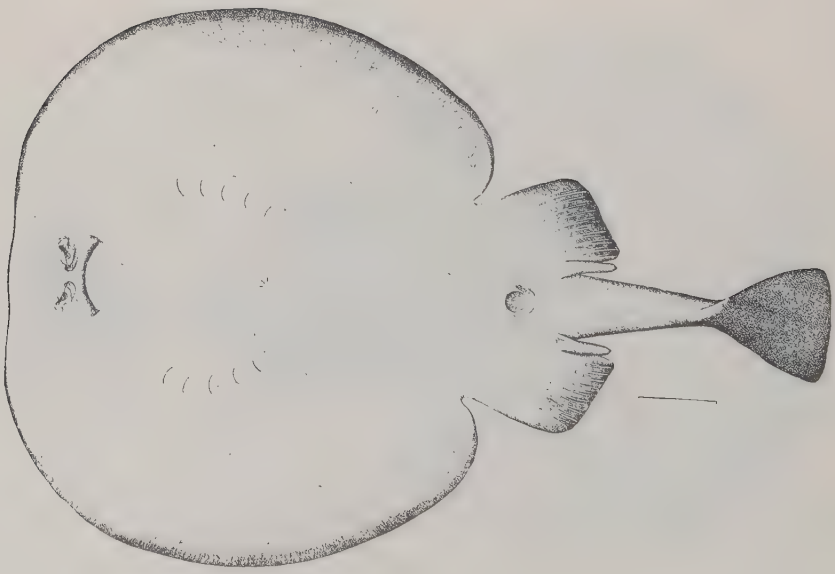
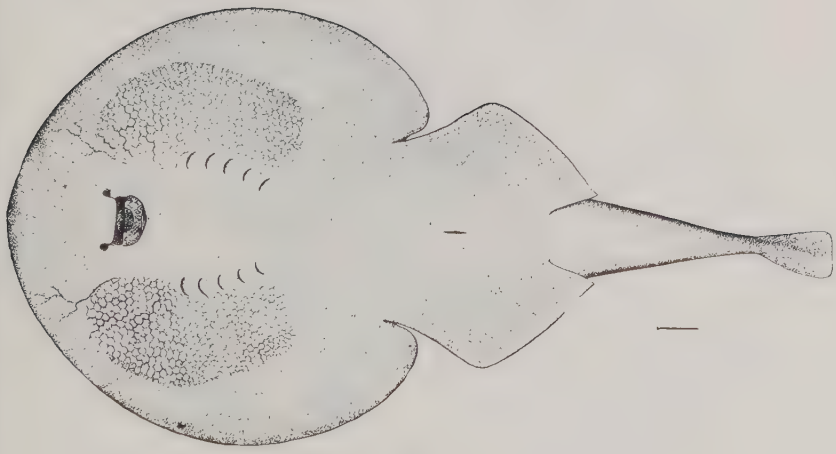


34*a*

34, 34*a*. TETRONARCE CALIFORNICA. (P. 77.)

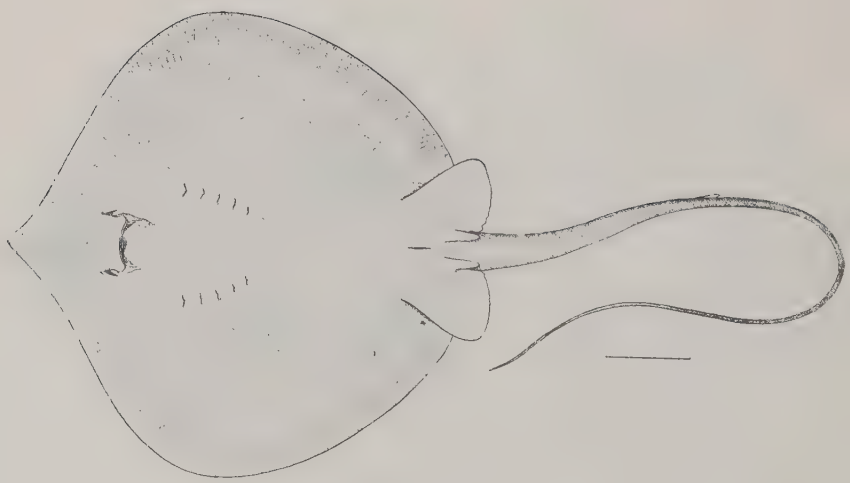
35



35*a*

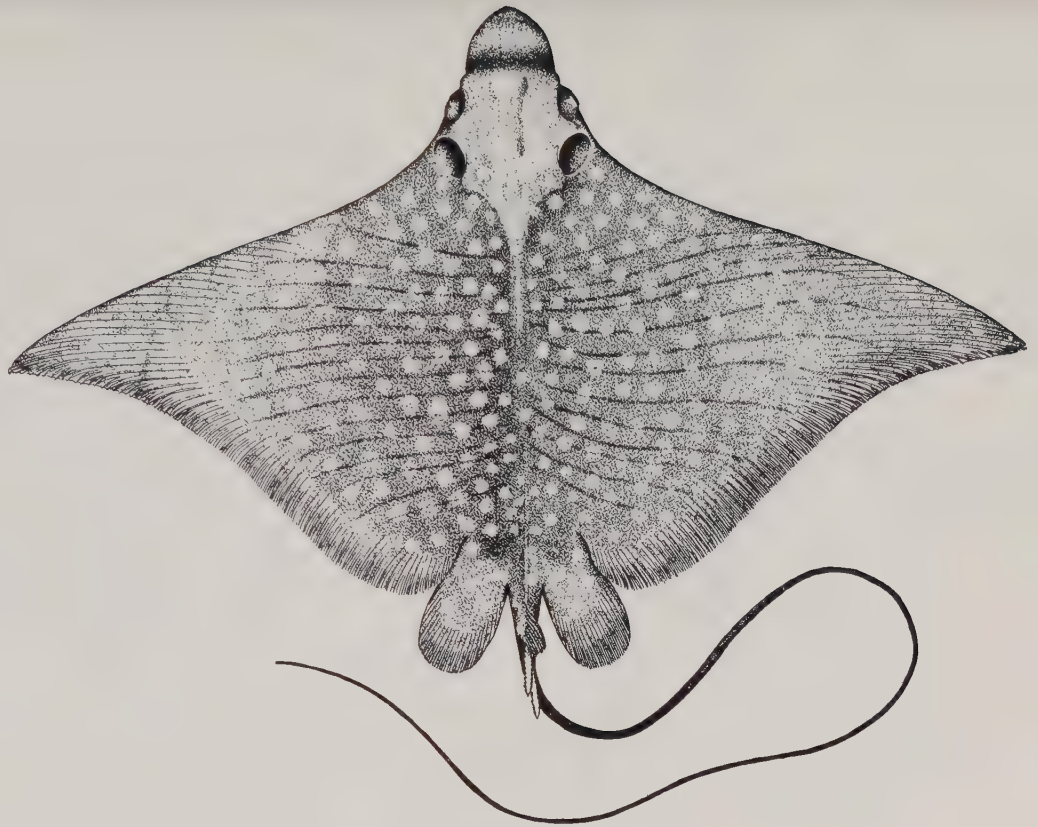
35, 35*a*. NARCINE BRASILIENSIS. (P. 78.)

36



36*a*

36, 36*a*. DASYATIS SABINA. (P. 84.)



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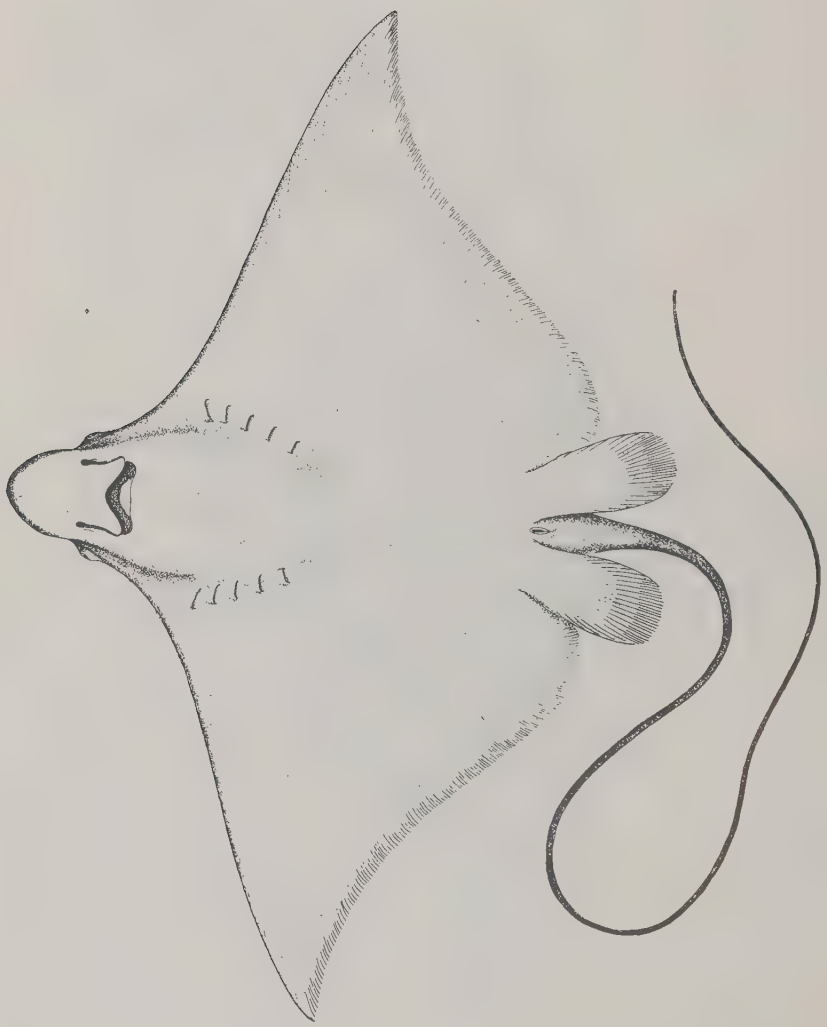
37. AETOBATUS NARINARI. (P. 88.)



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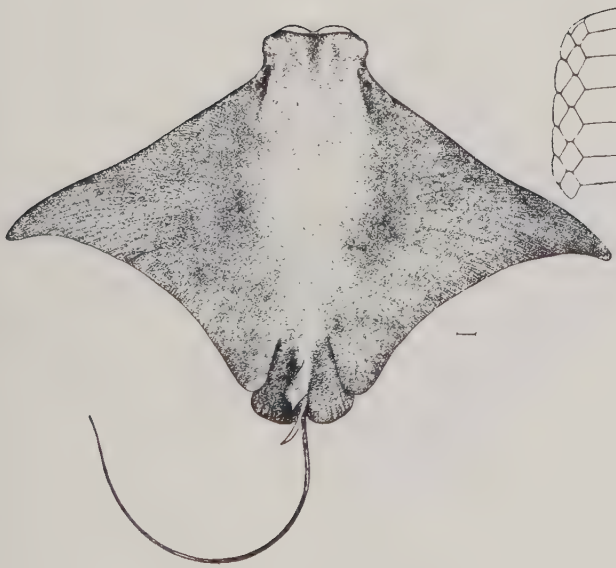

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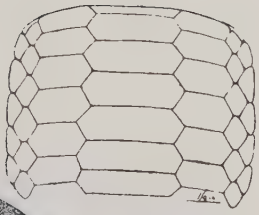
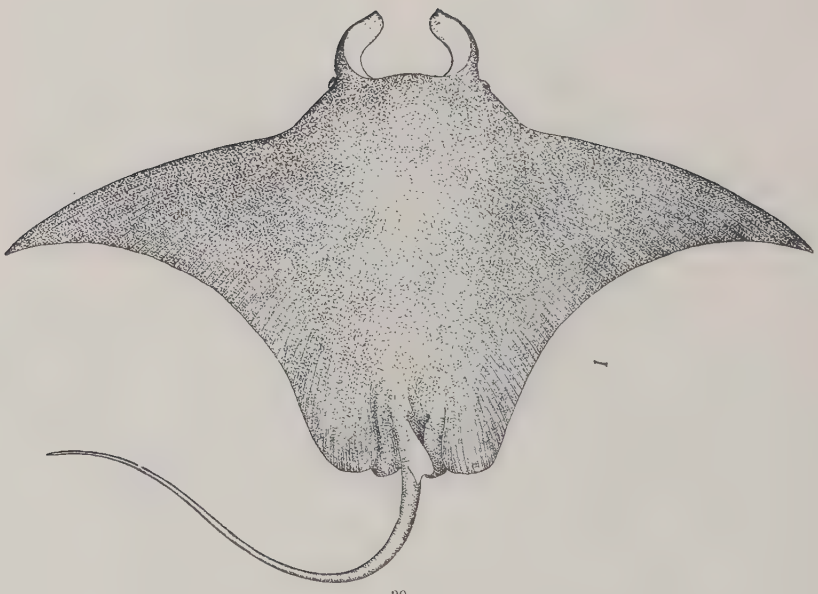


38*a*

38. RHINOPTERA STEINDACHNERI. (P. 91.)
38*a*. PAVED TEETH OF RHINOPTERA STEINDACHNERI. (P. 91.)



39

39. MANTA BIROSTRIS. (P. 92.)

40

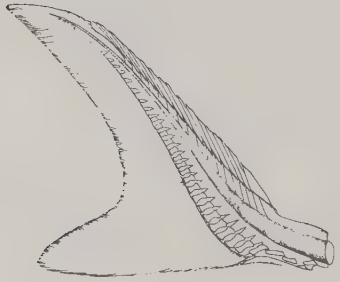
41

42

40. CHIMÆRA AFFINIS. (P. 95.)
41. HYDROLAGUS COLLIEI. (P. 95.)
42. HARRIOTTA RALEIGHANA. (P. 96.)

43

43*a*



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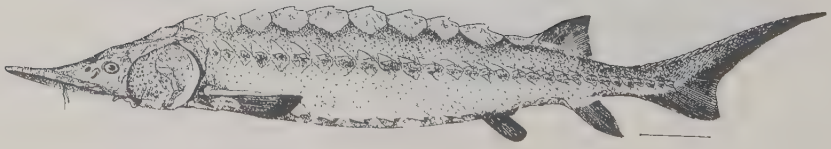


45

43, 43*a*. POLYODON SPATHULA. (P. 101.)
44. HETEROCERCAL TAIL OF ACIPENSER TRANSMONTANUS. (P. 104.)
45. ACIPENSER STURIO OXYRHYNCHUS. (P. 105.)

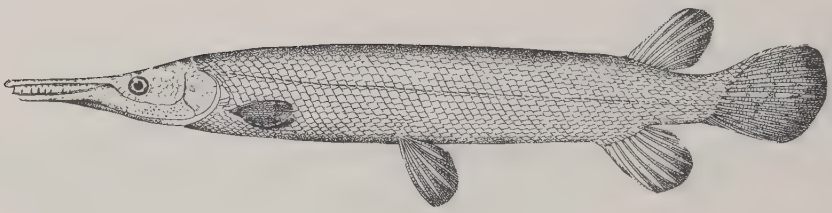
46

47

48

46. ACIPENSER RUBICUNDUS. (P. 106.)
47. ACIPENSER BREVIROSTRUM. (P. 106.)
48. SCAPHIRHYCHUS PLATORYNCHUS. (P. 107.)

49



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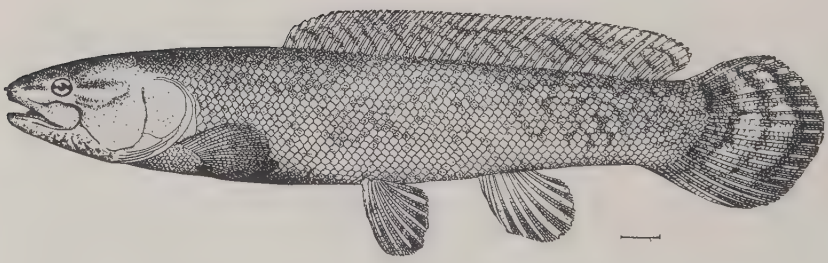

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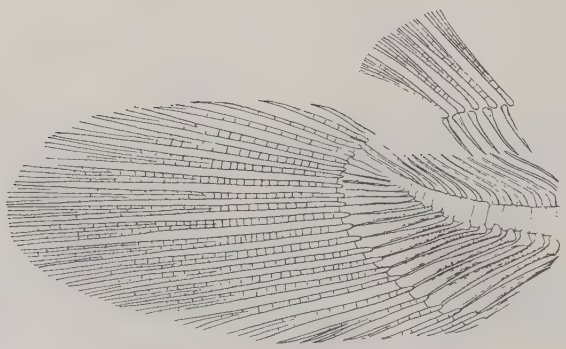


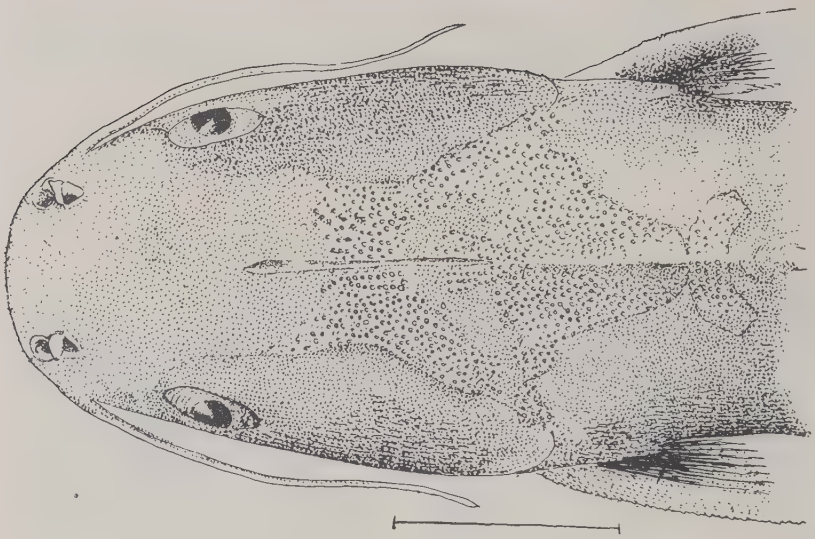
51*a*

49. Lepisosteus platostomus. (P. 110.)
50. Lepisosteus tristœchus. (P. 111.)
51. Amia calva; female. (P. 113.)
51*a*. Heterocercal tail of Amia calva. (P. 113.)

52

53

52. Felichthys marinus. (P. 118.)
53. Galeichthys felis. (P. 128.)



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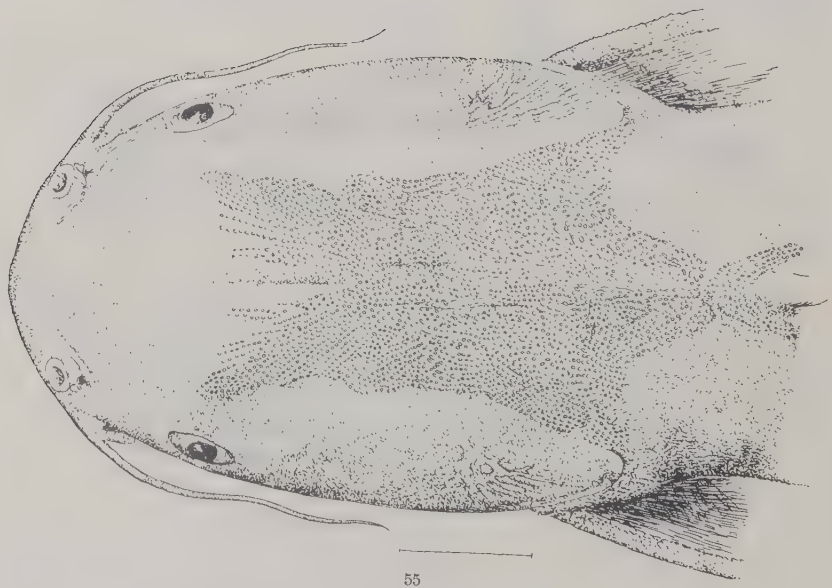


55

54. GALEICHTHYS GILBERTI. (P. 2773.)
55. GALEICHTHYS AZUREUS. (P. 2775.)

56

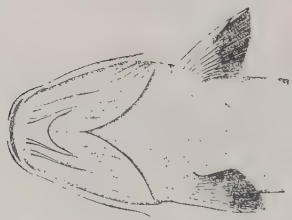
57

58

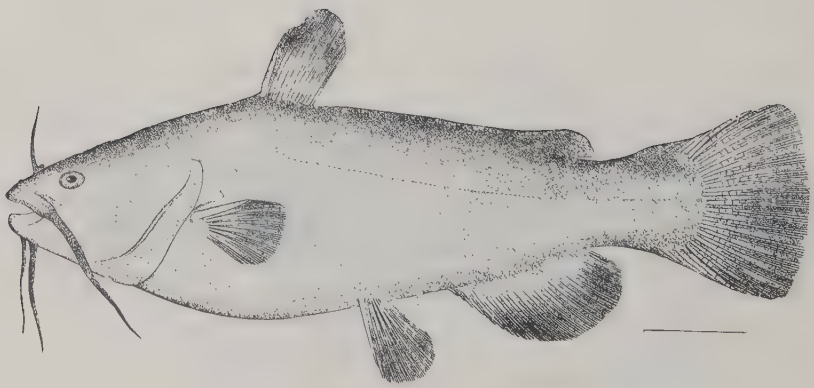
56. ICTALURUS FURCATUS. (P. 134.)
57. ICTALURUS ANGUILLA. (P. 2788.)
58. ICTALURUS PUNCTATUS. (P. 134.)

59

59*a*

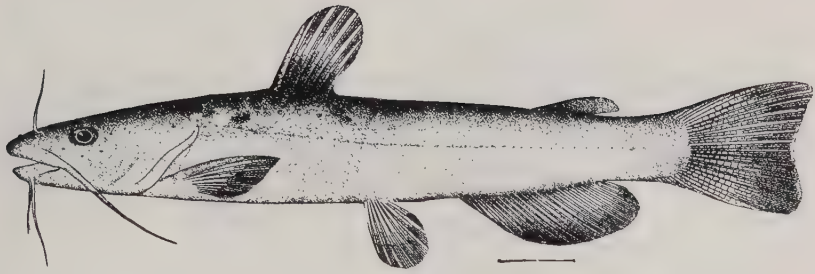


59*b*



60

59, 59*a*, 59*b*. AMEIURUS DUGESI. (P. 138.)
60. AMEIURUS MELAS. (P. 141.)



61

62

63

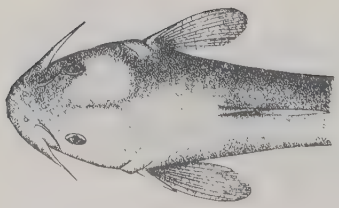
64

61. AMEIURUS PLATYCEPHALUS. (P. 142.)
62. LEPTOPS OLIVARIS. (P. 143.)
63. NOTURUS FLAVUS. (P. 144.)
64. SCHILBEODES NOCTURNUS. (P. 146.)

65

66

67



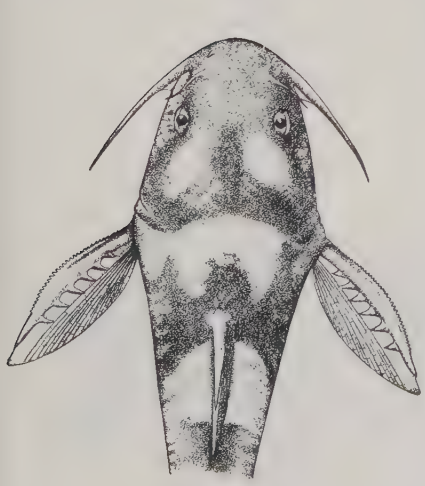
67*a*

67*b*

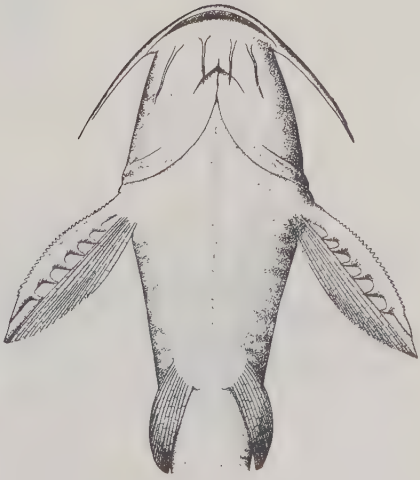
65. SCHILBEODES EXILIS. (P. 147.)
66. SCHILBEODES INSIGNIS. (P. 147.)
67, 67*a*, 67*b*. SCHILBEODES GILBERTI. (P. 148.)

68

69

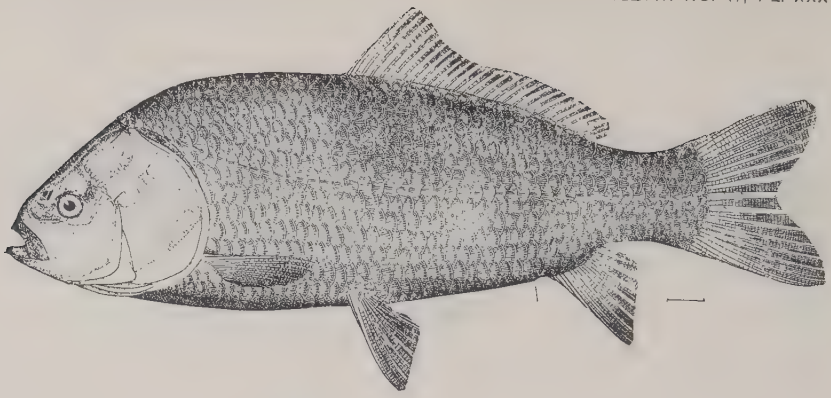


69*a*



69*b*

68. SCHILBEODES MIURUS. (P. 148.)
69, 69*a*, 69*b*. SCHILBEODES FURIOSUS. (P. 149.)



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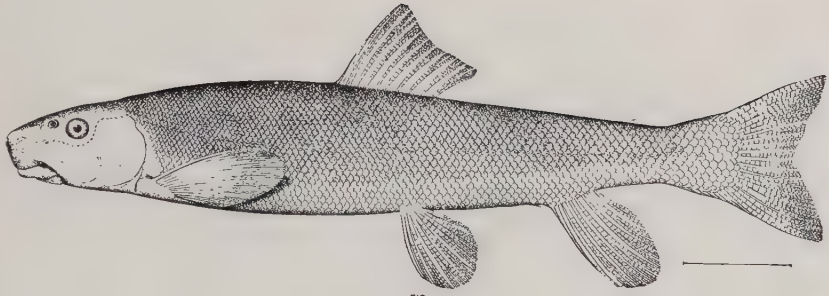
72

70. Ictiobus cyprinella. (P. 163.)
71. Carpiodes cyprinus. (P. 168.)
72. Cycleptus elongatus. (P. 168.)

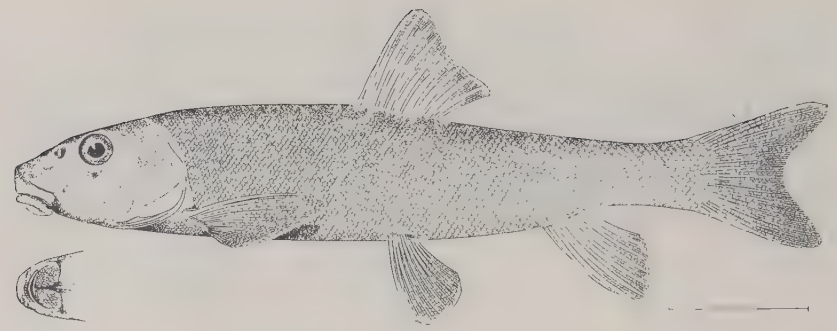


73

74

75

73. PANTOSTEUS JORDANI. (P. 171.)
74. CATOSTOMUS LATIPINNIS. (P. 174.)
75. CATOSTOMUS GRISEUS. (P. 175.)

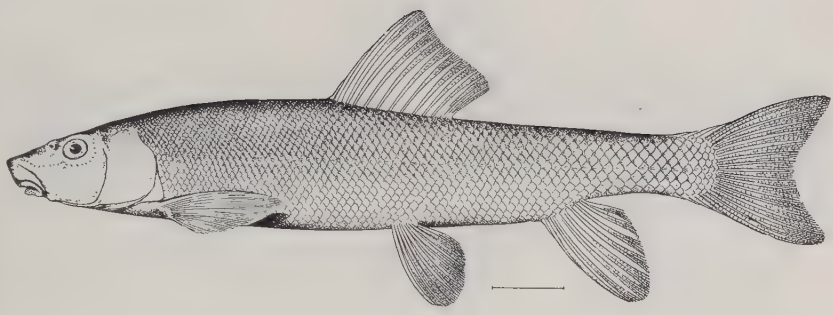


76

77

78

76. Catostomus pocatello. (P. 175.)
77. Catostomus catostomus. (P. 176.)
78. Catostomus tahoensis. (P. 177.)



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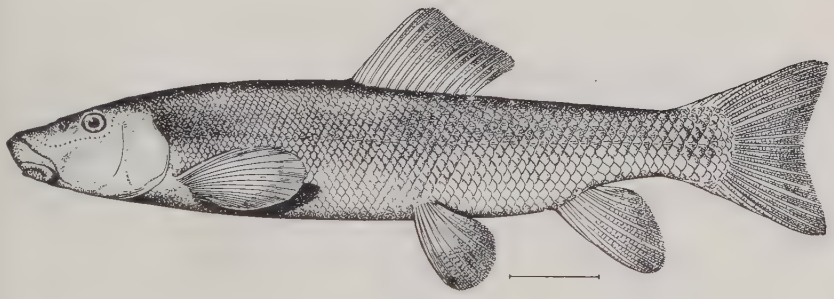

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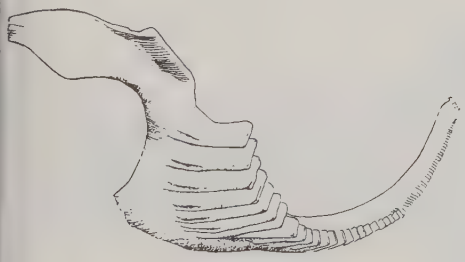

81

82

79. CATOSTOMUS OCCIDENTALIS. (P. 178.)
80. CATOSTOMUS TSILTCOOSENSIS. (P. 2793.)
81. PHARYNGEAL TEETH OF CATOSTOMUS MACROCHEILUS. (P. 178.)
82. PHARYNGEAL TEETH OF PLACOPHARYNX DUQUESNII. (P. 198.)

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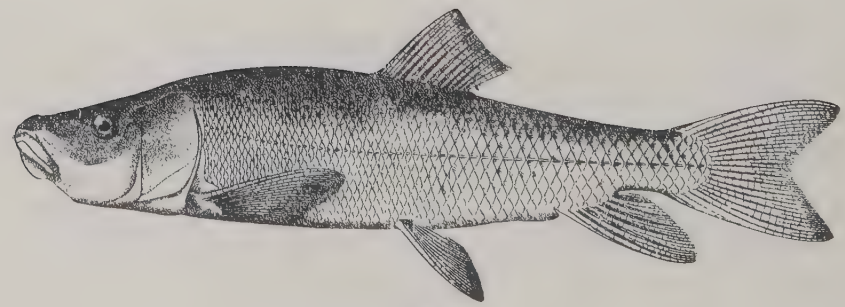
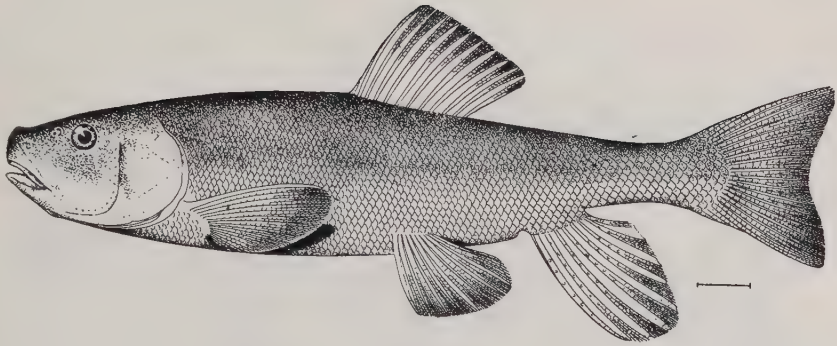


85

83. CATOSTOMUS COMMERSONII. (P. 178.)
84. CATOSTOMUS ARDENS. (P. 179.)
85. CHASMISTES LIORUS. (P. 183.)

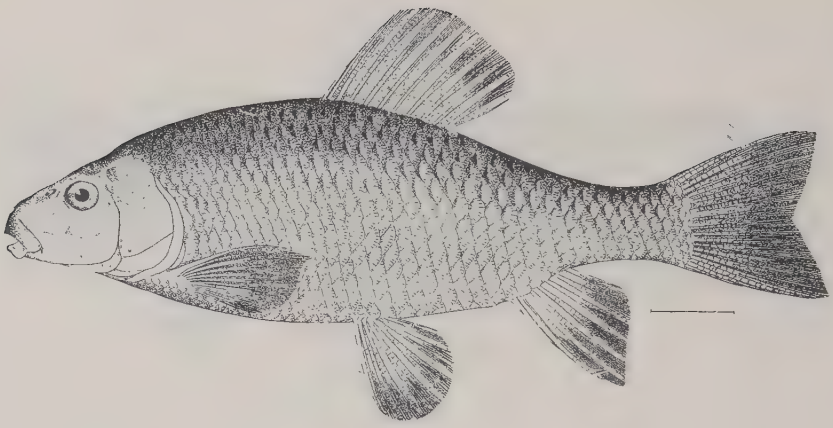


86

87

88

86. Chasmistes stomias. (P. 2794.)
87. Chasmistes copei. (P. 2795.)
88. Xyrauchen cypho. (P. 184.)



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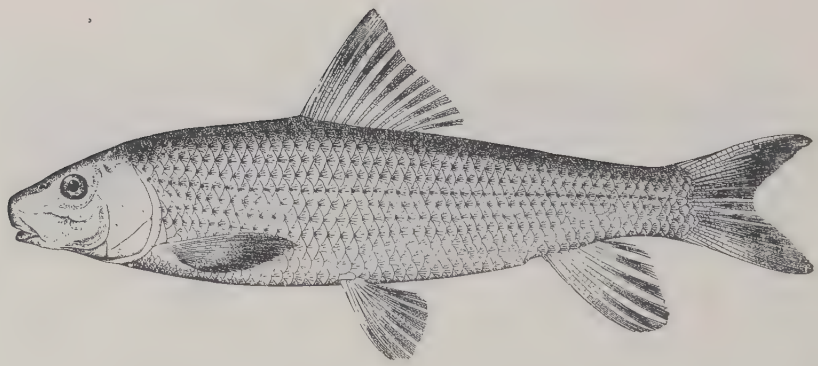

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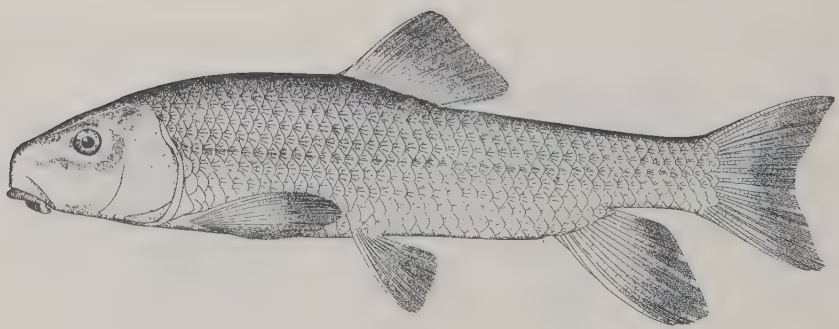
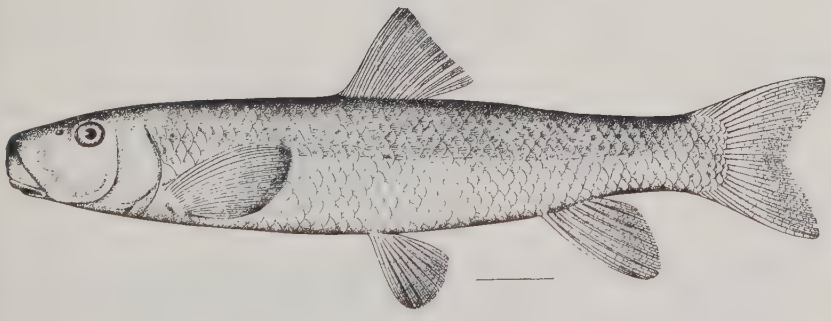


91

89. ERIMYZON SUCETTA. (P. 185.)
90. MINYTREMA MELANOPS. (P. 187.)
91. MOXOSTOMA CONGESTUM. (P. 192.)

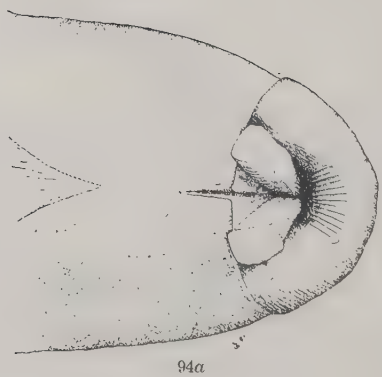
92



93

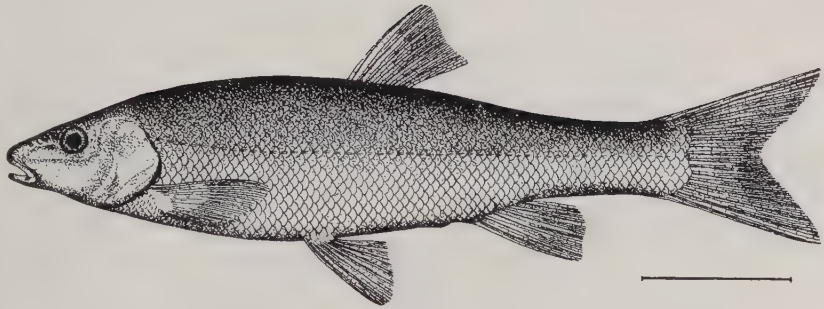
92. MOXOSTOMA AUSTRINUM. (P. 192.)
93. MOXOSTOMA RUPISCARTES. (P. 196.)

94



94*a*

94, 94*a*. LAGOCHILA LACERA. (P. 199.)



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95. Campostoma anomalum. (P. 205.)
96. Orthodon microlepidotus. (P. 207.)
97. Acrocheilus alutaceus. (P. 208.)

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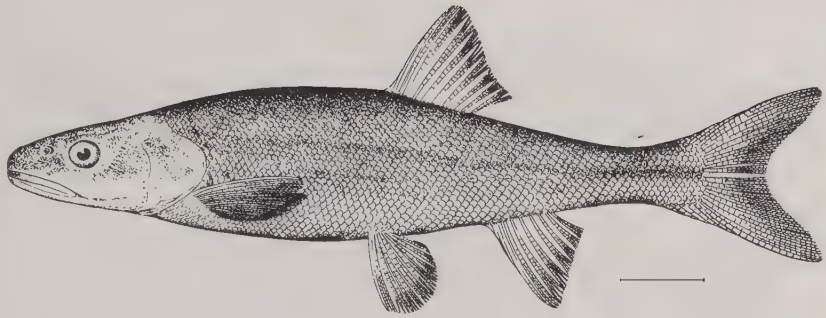
98. Algansea dugesi. (P. 211.)
99. Mylocheilus caurinus. (P. 219.)
100. Semotilus atromaculatus. (P. 222.)

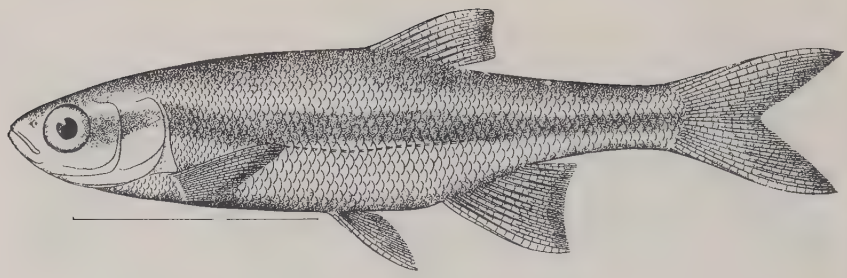


101

102

103

101. PTYCHOCHEILUS OREGONENSIS. (P. 224.)
102. LEUCISCUS BICOLOR. (P. 232.)
103. LEUCISCUS LINEATUS. (P. 232.)



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105*a*

104. LEUCISCUS HYDROPHLOX. (P. 238.)
105. LEUCISCUS BALTEATUS. (P. 238.)
105*a*. LEUCISCUS BALTEATUS, FROM TYPE OF LEUCISCUS GILLII. (P. 238.)

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106. Leuciscus siuslawi. (P. 2797.)
107. Rutilus bicolor. (P. 244.)

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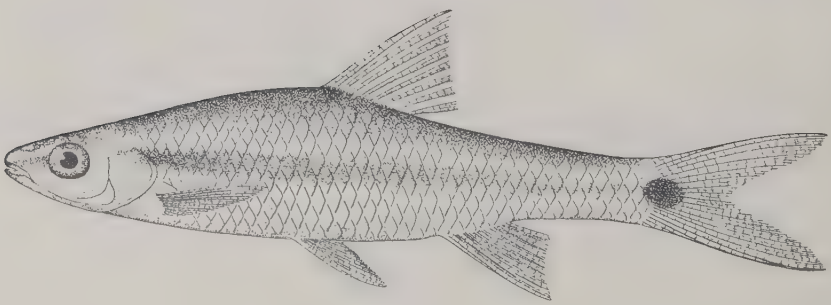

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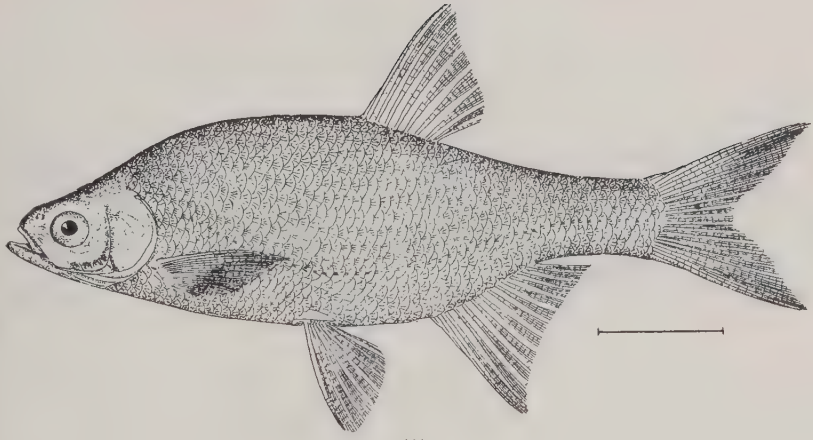
108. OPSOPŒODUS OSCULUS. (P. 248.)
109. OPSOPŒODUS EMILIÆ. (P. 248.)
110. OPSOPŒODUS BOLLMANI. (P. 249.)



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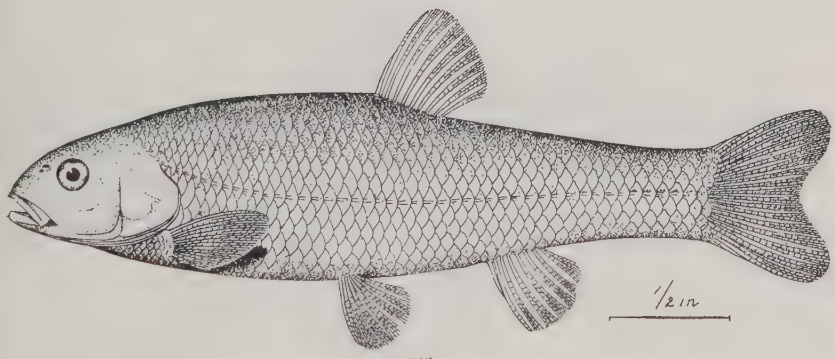
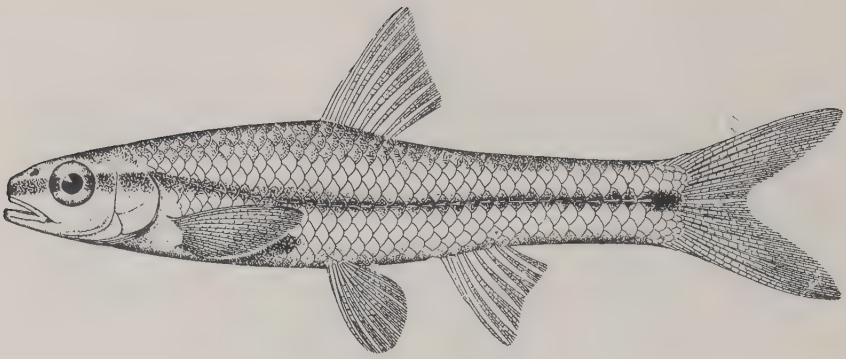


112

113

111. Abramis crysoleucas. (P. 250.)
112. Notropis aztecus. (P. 258.)
113. Notropis welaka. (P. 2799.)



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114. NOTROPIS CAYUGA ATROCAUDALIS. (P. 260.)
115. NOTROPIS KANAWHA. (P. 264.)
116. NOTROPIS CHIHUAHUA. (P. 265.)

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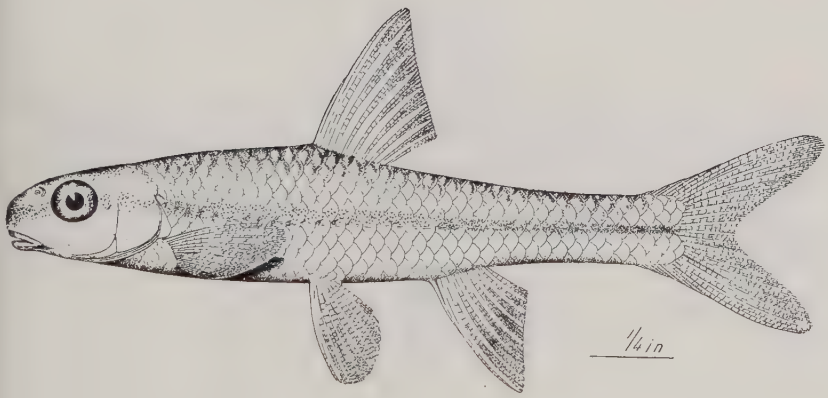

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117. NOTROPIS NUX. (P. 267.)
118. NOTROPIS NOCOMIS. (P. 268.)
119. NOTROPIS HUDSONIUS. (P. 269.)

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120. NOTROPIS HUDSONIUS SALUDANUS. (P. 270.)
121. NOTROPIS WHIPPLII. (P. 278.)
122. NOTROPIS GALACTURUS. (P. 279.)

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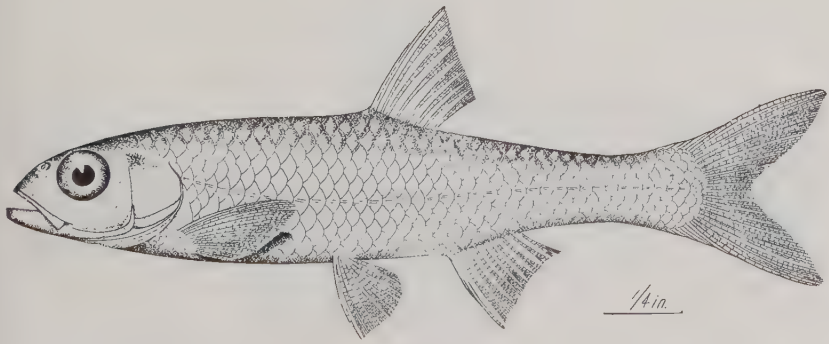
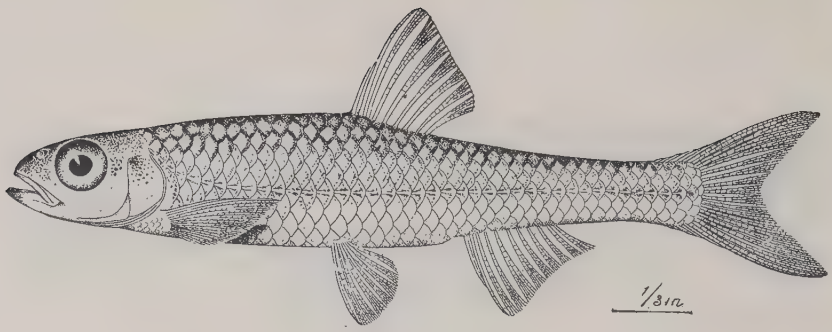


125

123. NOTROPIS MACDONALDI. (P. 284.)
124. NOTROPIS COCCOGENIS. (P. 284.)
125. NOTROPIS SWAINI. (P. 290.)



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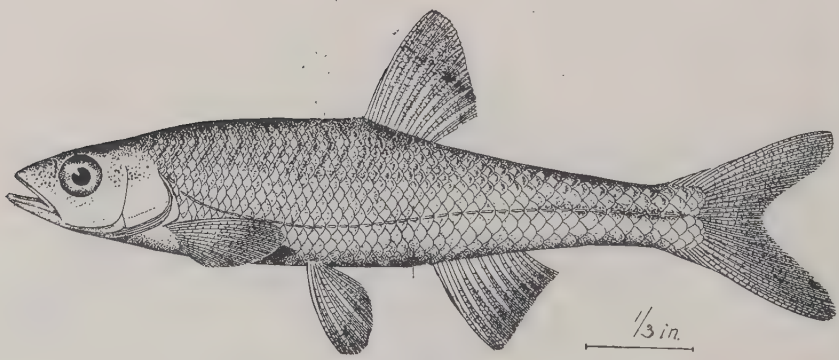

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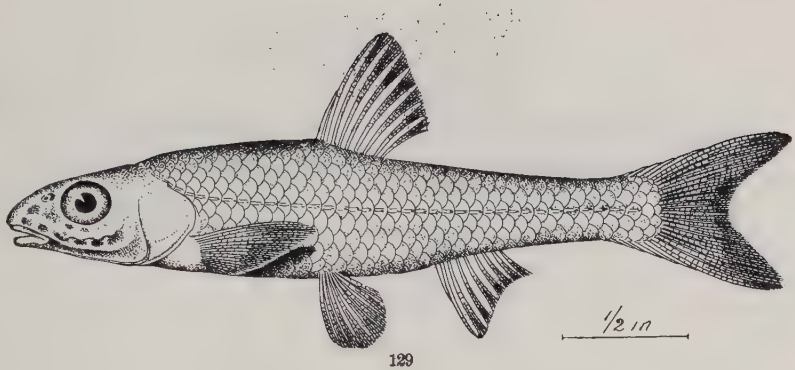
126. NOTROPIS TELESCOPUS. (P. 292.)
127. NOTROPIS NOTEMIGONOIDES. (P. 292.)
128. NOTROPIS METALLICUS. (P. 297.)



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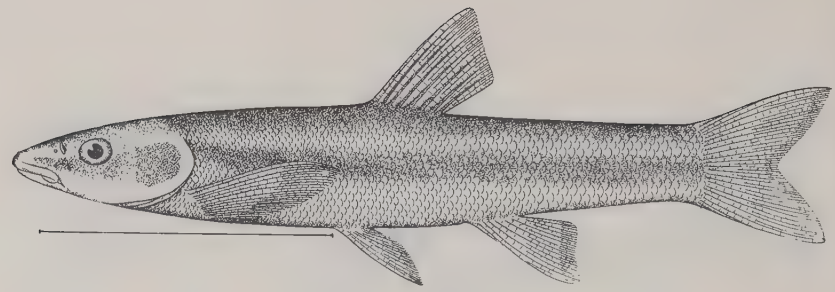
129. ERICYMBA BUCCATA. (P. 302.)
130. PHENACOBIUS URANOPS. (P. 304.)
131. EVARRA EIGENMANNI. (P. 304.)



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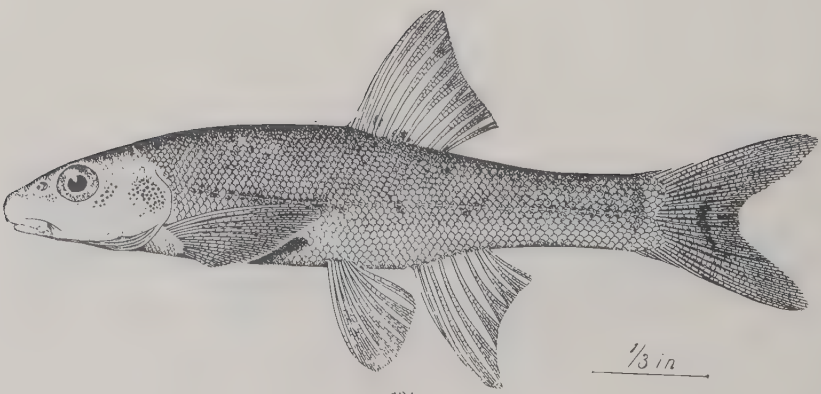
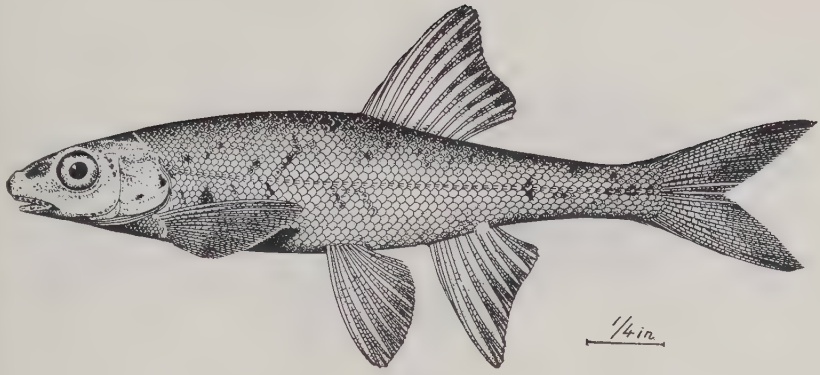


134

132. RHINICHTHYS DULCIS. (P. 306.)
133. AGOSIA KLAMATHENSIS. (P. ——.)
134. AGOSIA UMATILLA. (P. 313.)



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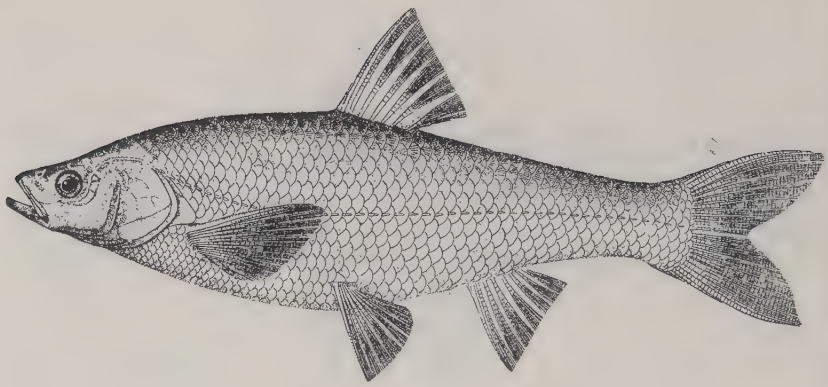
137

135. AGOSIA FALCATA. (P. 313.)
136. HYBOPSIS ÆSTIVALIS MARCONIS. (P. 316.)
137. HYBOPSIS WATAUGA. (P. 319.)



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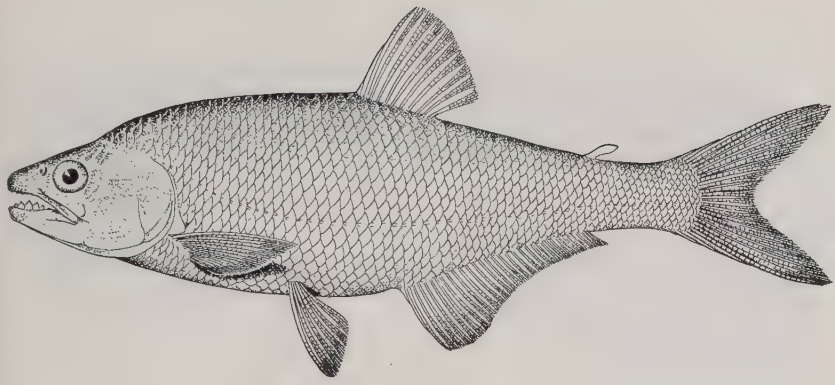
138. HYBOPSIS ALTUS. (P. 321.)
139. PLATYGOBIO GRACILIS. (P. 326.)
140. EXOGLOSSUM MAXILLINGUA. (P. 327.)



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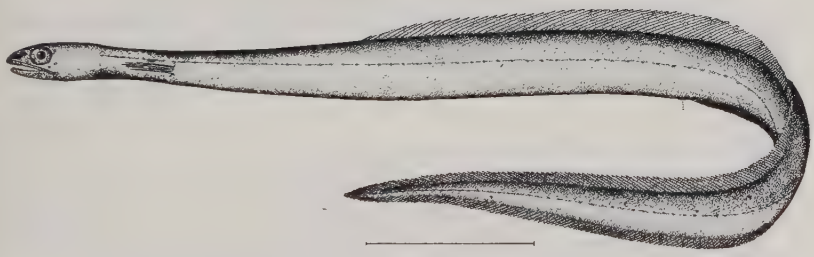

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143

141. Brycon dentex. (P. 337.)
142. Derichthys serpentinus. (P. 343.)
143. Anguilla chrysypa. (P. 348.)

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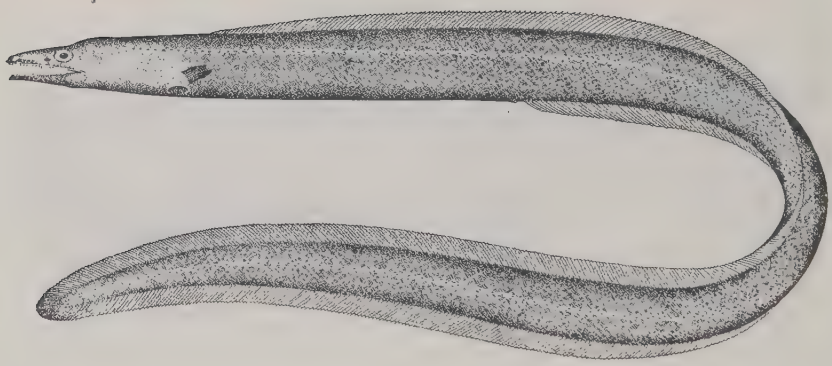

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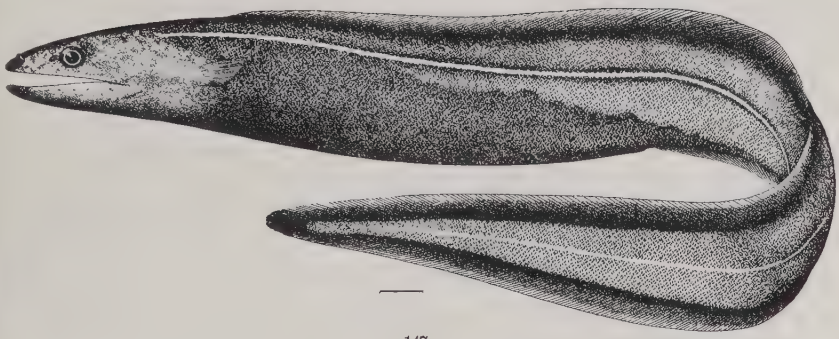
144. SIMENCHELYS PARASITICUS. (P. 349.)
145. ILYOPHIS BRUNNEUS. (P. 350.)
146. SYNAPHOBRANCHUS PINNATUS. (P. 351.)



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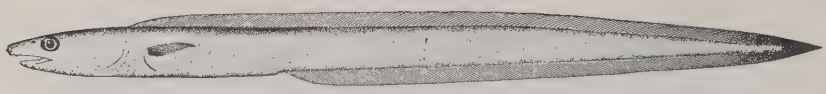
147. Histiobranchus infernalis. (P. 352.)
148. Leptocephalus conger. (P. 354.)
149. Leptocephalus caudilimbatus. (P. 355.)



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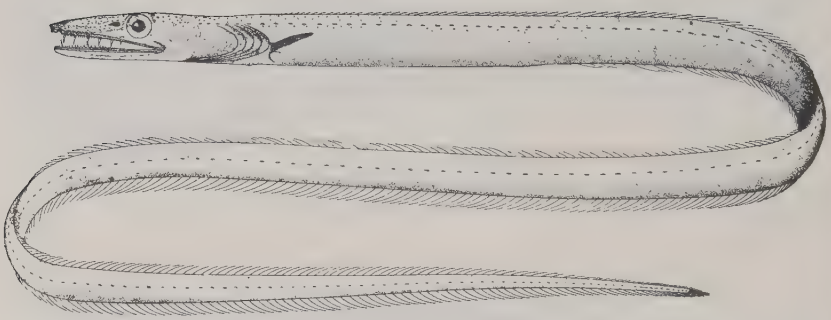

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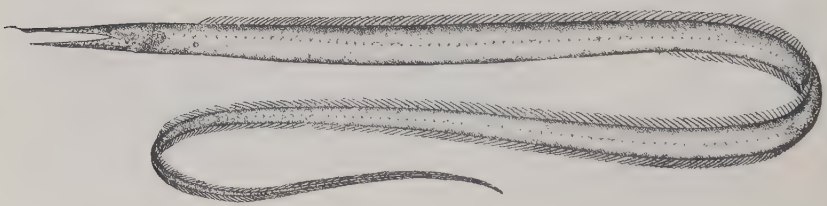

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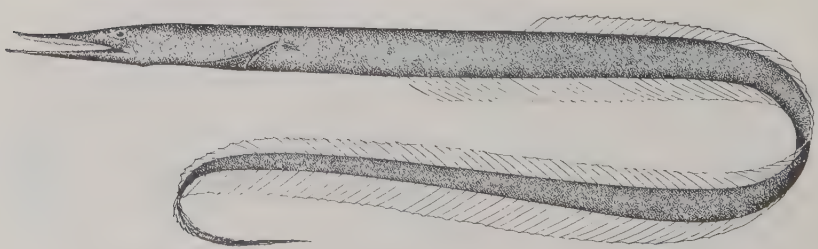

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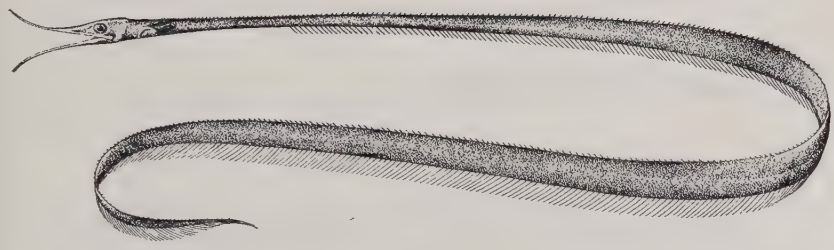
150. CONGRELLUS FLAVUS. (P. 357.)
151. HOPLUNNIS SCHMIDTII. (P. 361.)
152. VENEFICA PROCERA. (P. 365.)
153. SERRIVOMER BEANII. (P. 367.)



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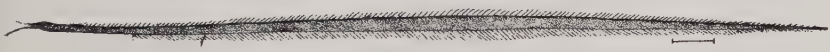
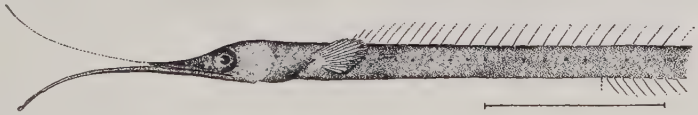
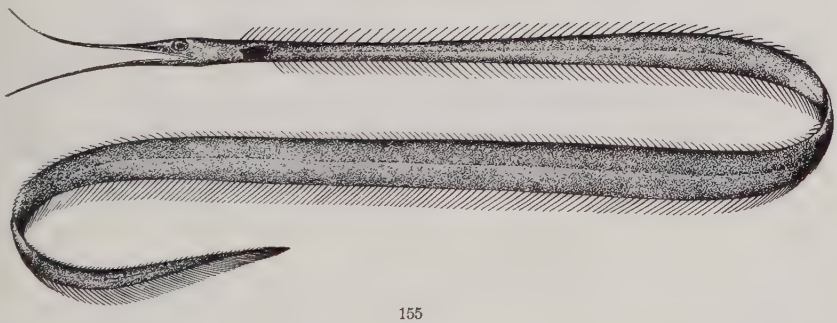


154*a*



154*b*



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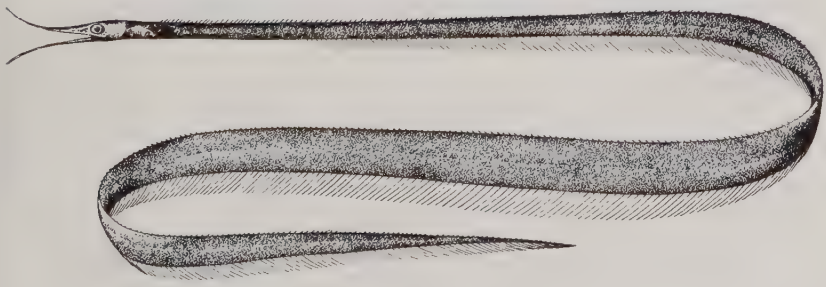
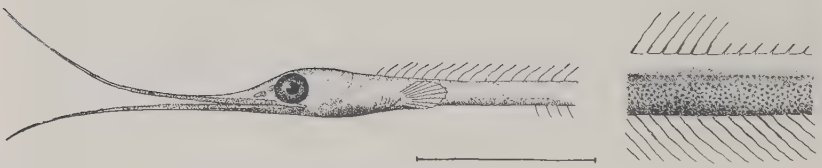


156

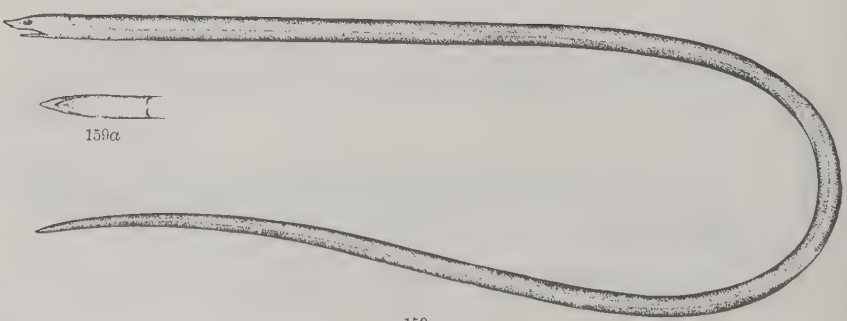
154. AVOCETTINA GILLI. (Pp. 367, 2801.)
154*a*, 144*b*. AVOCETTINA GILLI. (P. 2801.)
155. LABICHTHYS CARINATUS. (P. 368.)
156. LABICHTHYS ELONGATUS. (P. 369.)

157



157*a* 157*b*

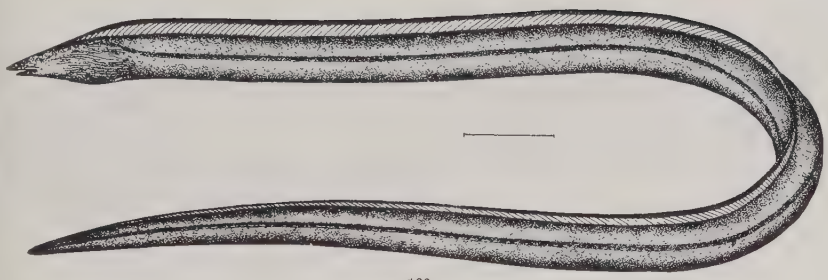
158



159*a*

159

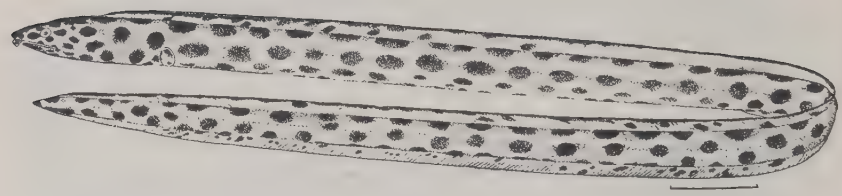
157, 157*a*, 157*b*. NEMICHTHYS AVOCETTA. (P. 369.)
158. AHLIA EGMONTIS. (P. 370.)
159, 159*a*. VERMA KENDALLI. (P. 375.)



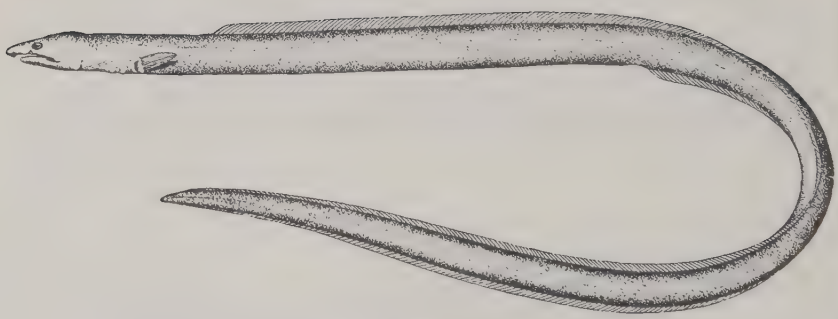
160

161

160. LETHARCHUS VELIFER. (P. 375.)
161. MYRICHTHYS TIGRINUS. (P. 376.)

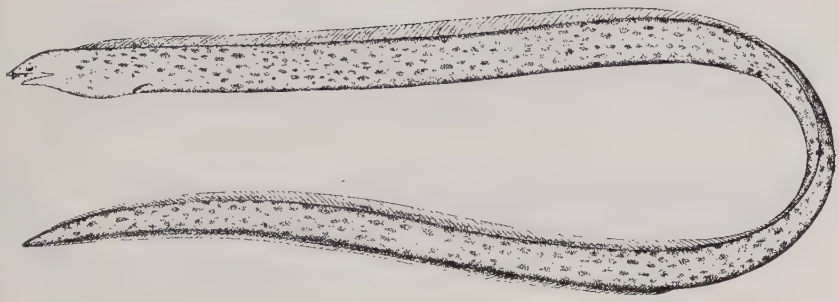


162



163

162. MYRICHTHYS PANTOSTIGMIUS. (P. 2802.)
163. PISOODONOPHIS CRUENTIFER. (P. 377.)



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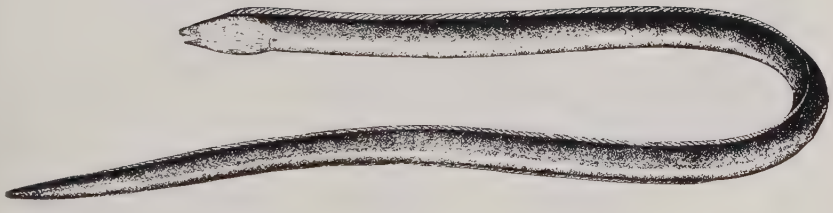

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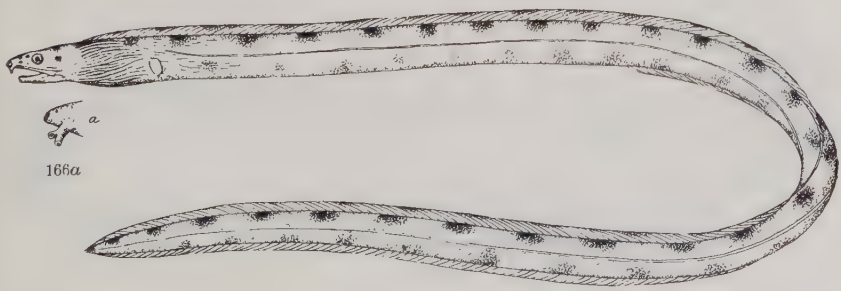
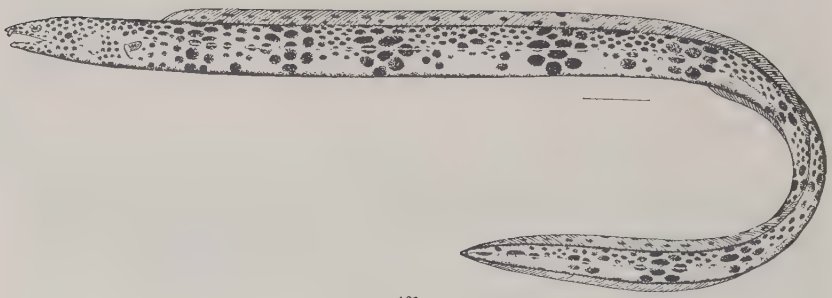


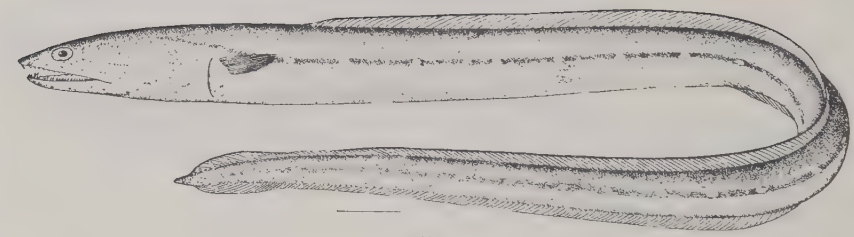
166*a*

166

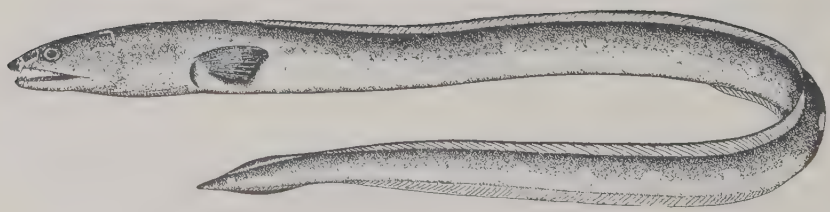
164. CALECHELYS MURÆNA. (P. 378.)
165. BASCANICHTHYS SCUTICARIS. (P. 378.)
166, 166*a*. BASCANICHTHYS PENINSULÆ. (P. 379.)



167



168



169

167. Qassiremus evionthas. (P. 380.)
168. Ophichthus guttifer. (P. 383.)
169. Ophichthus ocellatus. (P. 383.)

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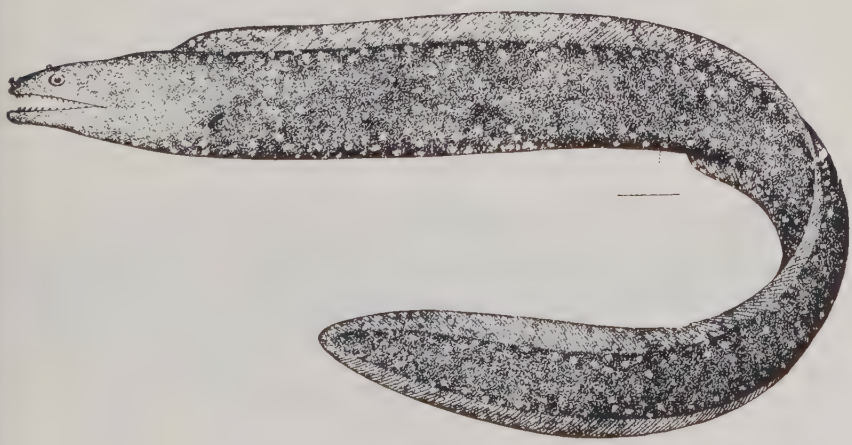
171



172

170. MYSTRIOPHIS INTERTINCTUS. (P. 386.)
171. LYCODONTIS MORINGA. (P. 395.)
172. MURÆNA INSULARUM. (P. 400.)

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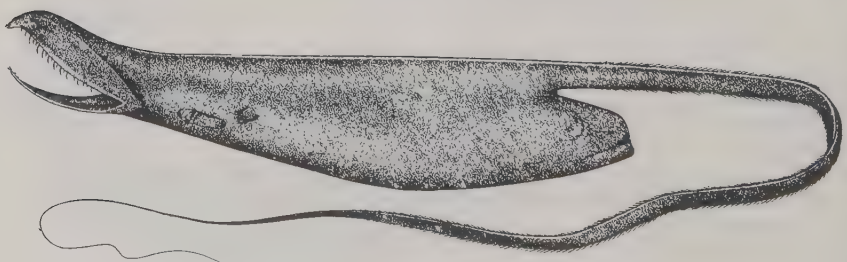
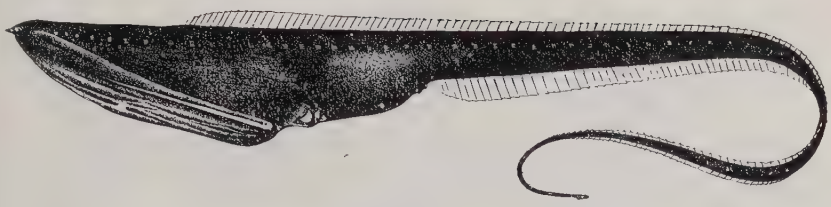


175

173. Muræna retifera. (P. 401.)
174. Channomuræna vittata. (P. 404.)
175. Saccopharynx ampullaceus. (P. 406.)

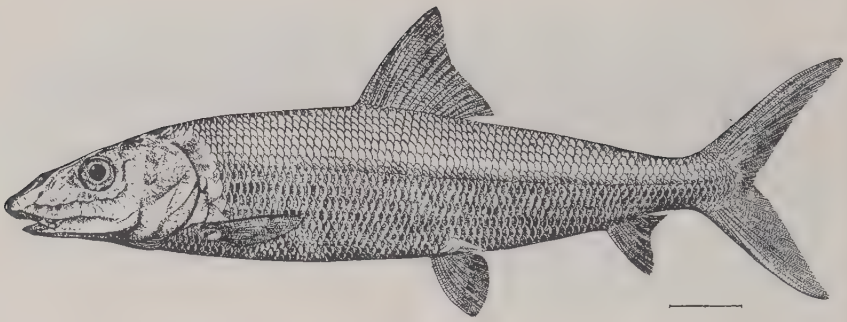


176

177

178

176. Gastrostomus bairdii. (P. 406.)
177. Tarpon atlanticus. (P. 409.)
178. Elops saurus. (P. 410.)



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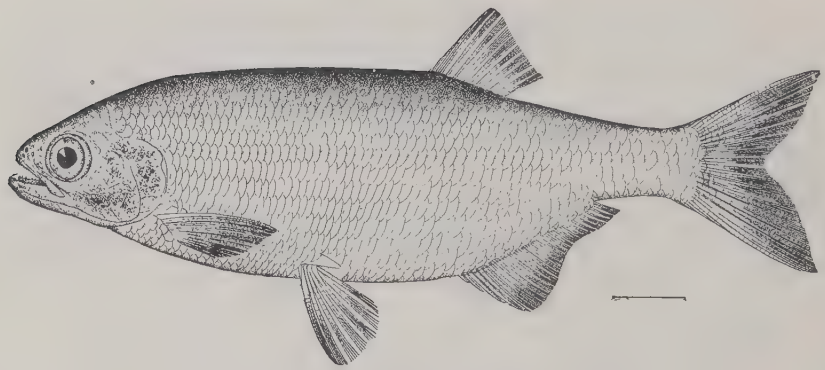

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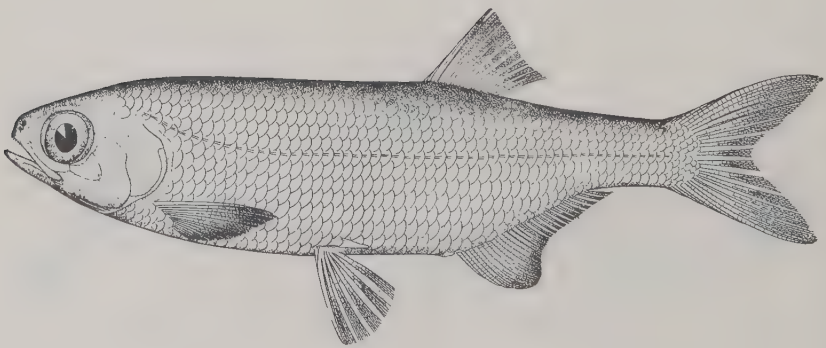
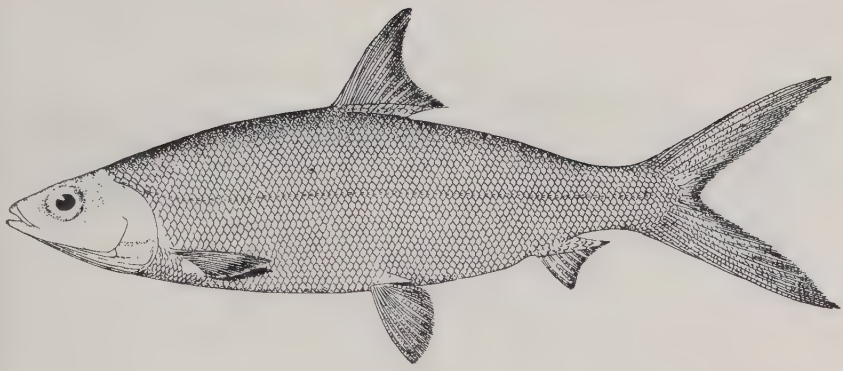


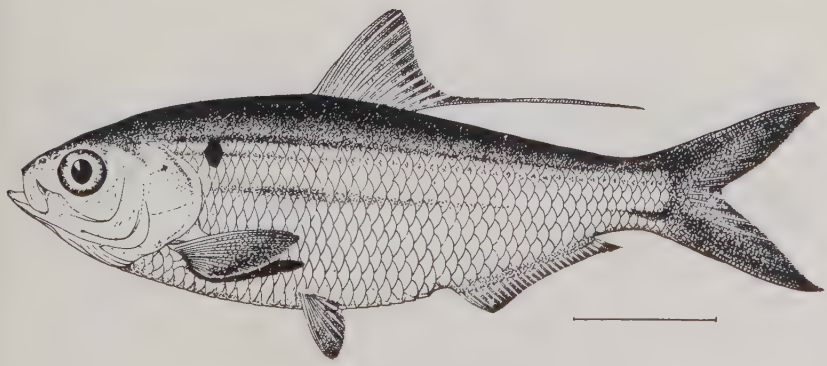
181

179. Albula vulpes. (P. 411.)
180. Hiodon tergisus. (P. 413.)
181. Hiodon selenops. (P. 414.)



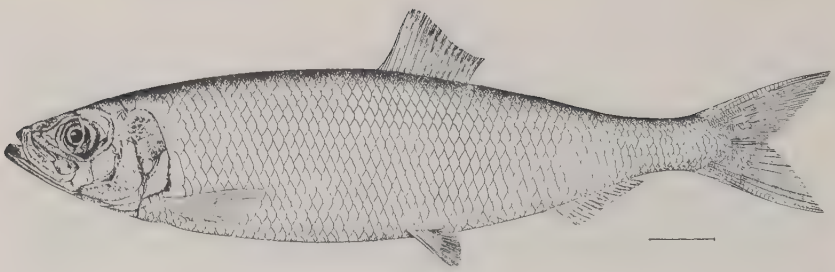
182

183



184

182. Chanos chanos. (P. 414.)
183. Dorosoma cepedianum. (P. 416.)
184. Signalosa atchafalayæ. (P. 2809.)



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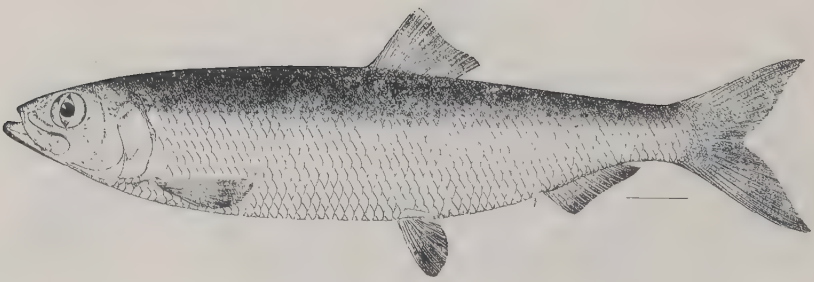
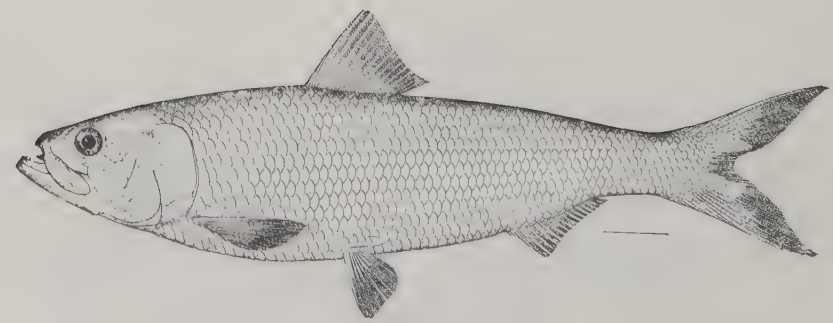


186

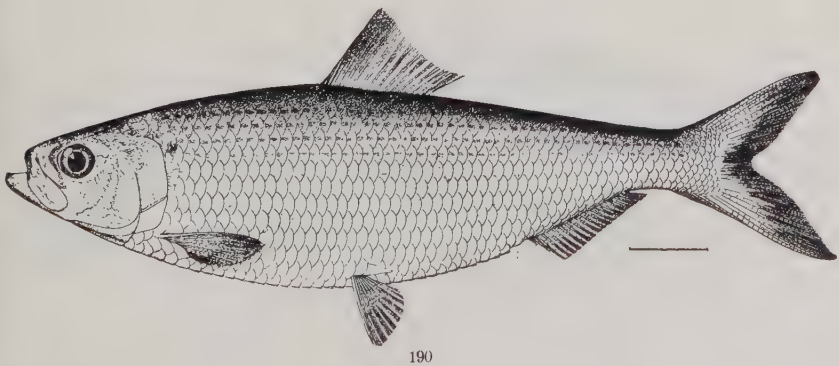


187

185. CLUPEA HARENGUS. (P. 421.)
186. CLUPEA PALLASII. (P. 422.)
187. POMOLOBUS CHRYSOCHLORIS. (P. 425.)

188

189



190

188. POMOLOBUS MEDIOCRIS. (P. 425.)
189. POMOLOBUS PSEUDOHARENGUS. (P. 426.)
190. POMOLOBUS ÆSTIVALIS. (P. 426.)

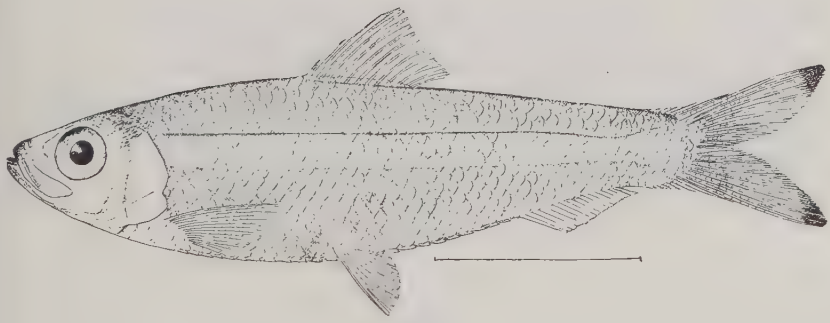
191

192

192*a*

191. ALOSA SAPIDISSIMA. (P. 427.)
192. ALOSA ALABAMÆ; male. (P. 2810.)
192*a*. ALOSA ALABAMÆ; female. (P. 2810.)

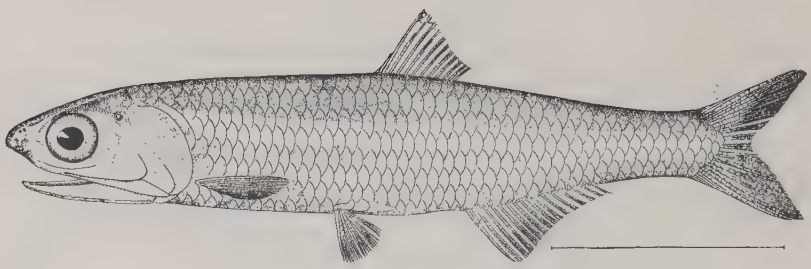
193



194

195

193. SARDINELLA SARDINA. (P. 430.)
194. SARDINELLA STOLIFERA. (P. 431.)
195. BREVOORTIA TYRANNUS. (P. 433.)



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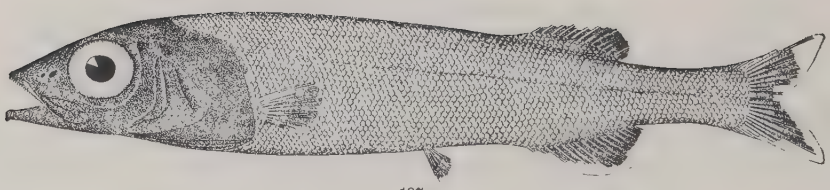
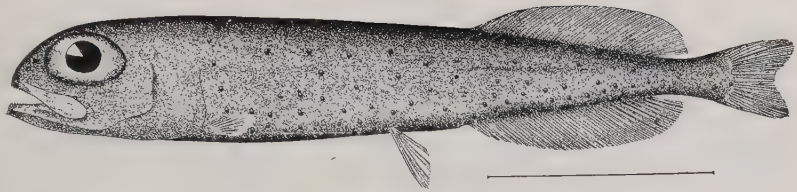


197

198

196. Stolephorus perthecatus. (P. 442.)
197. Alepocephalus agassizii. (P. 453.)
198. Talismania antillarum. (P. 455.)



199

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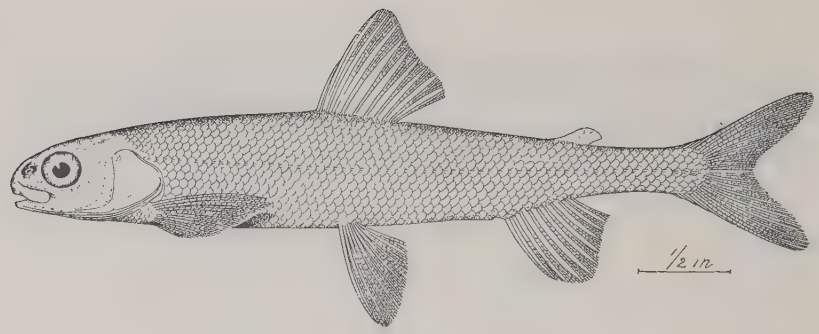
200*a*

199. ALEPOSOMUS COPEI. (P. 459.)
200. COREGONUS WILLIAMSONI. (P. 463.)
200*a*. COREGONUS WILLIAMSONI; young. (P. 463.)



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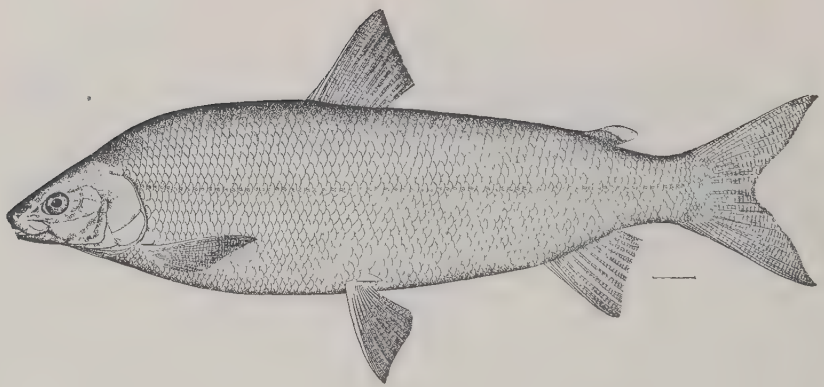

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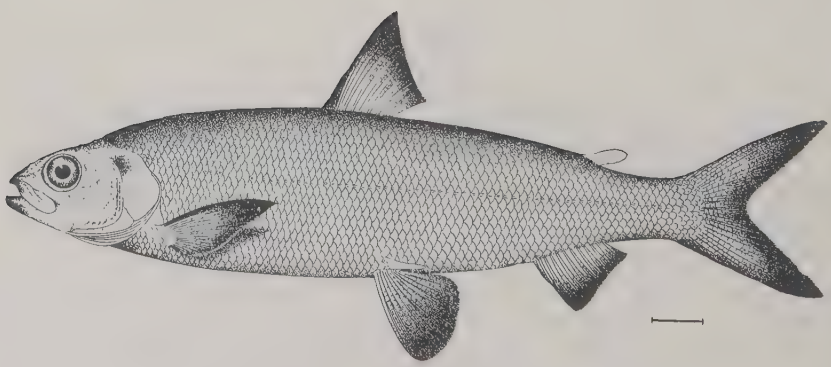
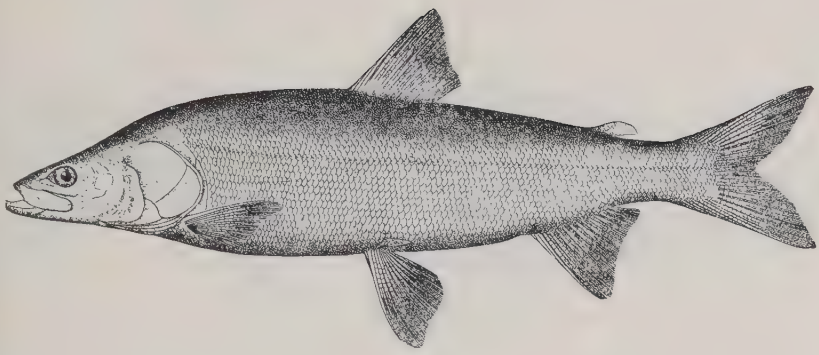


203

201. Coregonus coulterii. (P. 462.)
202. Coregonus clupeiformis. (P. 465.)
203. Argyrosomus nigripinnis. (P. 472.)



204

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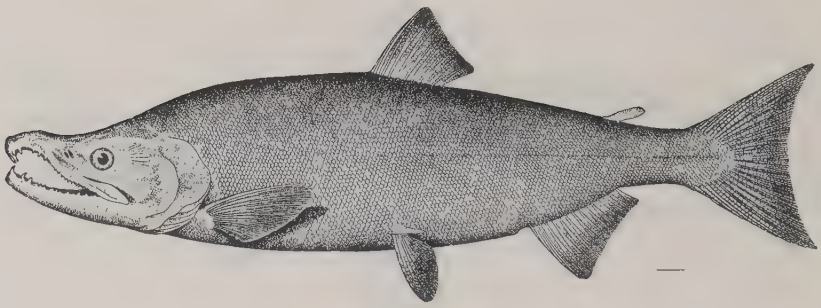
206

204. STENODUS MACKENZII. (P. 474.)
205. ONCORHYNCHUS GORBUSCHA. (P. 478.)
206. ONCORHYNCHUS TSCHAWYTSCHA. (P. 479.)



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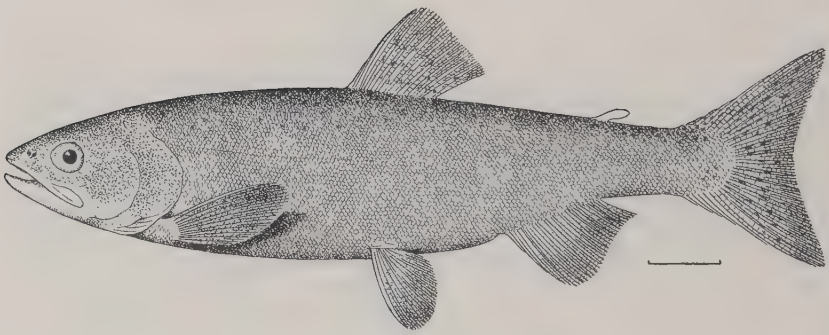
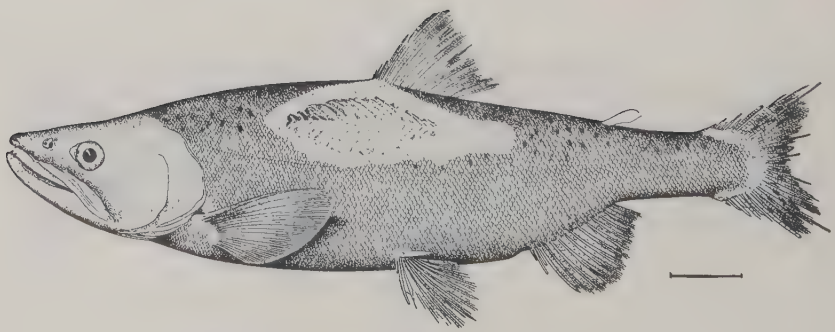


207*a*



207*b*

207. ONCORHYNCHUS NERKA; adult male, large form. (P. 481.)
207*a*. ONCORHYNCHUS NERKA; adult female, small form. (P. 481.)
207*b*. ONCORHYNCHUS NERKA; adult mutilated male, small form. (P. 481.)

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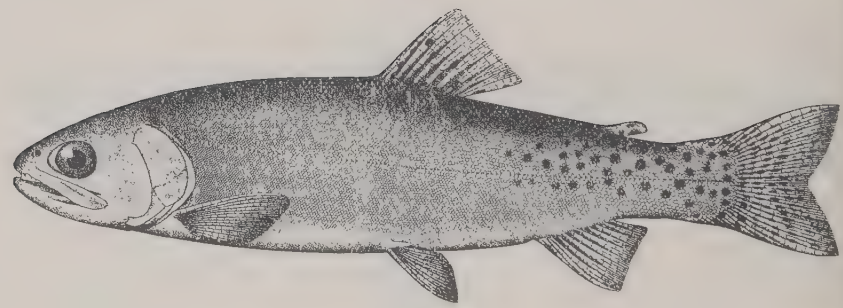
208. SALMO CLARKII HENSHAWI. (Pp. 493, 2819.)
209. SALMO CLARKII VIRGINALIS. (Pp. 495, 2819.)
210. SALMO CLARKII SPILURUS. (Pp. 495, 2819.)

211



212

213

211. SALMO CLARKII PLEURITICUS. (Pp. 496, 2819.)
212. SALMO CLARKII BOUVIERI. (Pp. 496, 2819.)
213. SALMO CLARKII STOMIAS. (Pp. 497, 2819.)

214

215

216

214. SALMO CLARKII MACDONALDI. (Pp. 497, 2819.)
215. SALMO GAIRDNERI. (P. 497.)
216. SALMO IRIDEUS. (P. 500.)

217

218

219

217. CRISTIVOMER NAMAYCUSH. (P. 504.)
218. SALVELINUS FONTINALIS. (P. 506.)
219. SALVELINUS MALMA. (P. 507.)

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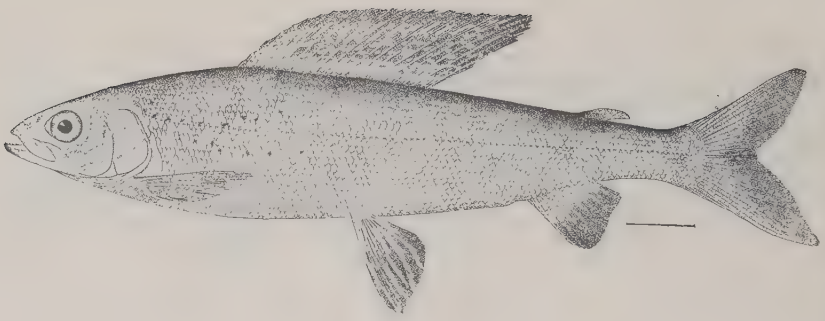
222

220. SALVELINUS ALPINUS AUREOLUS. (P. 511.)
221. SALVELINUS OQUASSA. (P. 514.)
222. THYMALLUS SIGNIFER. (P. 517.)



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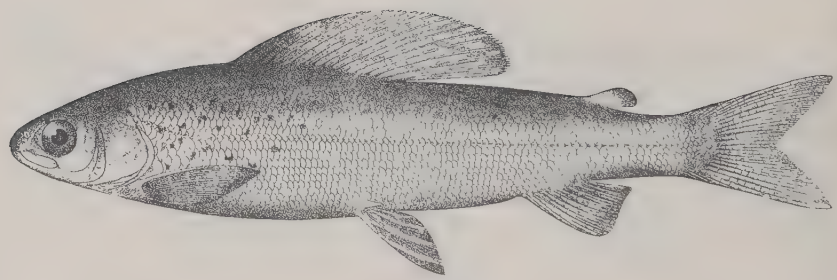

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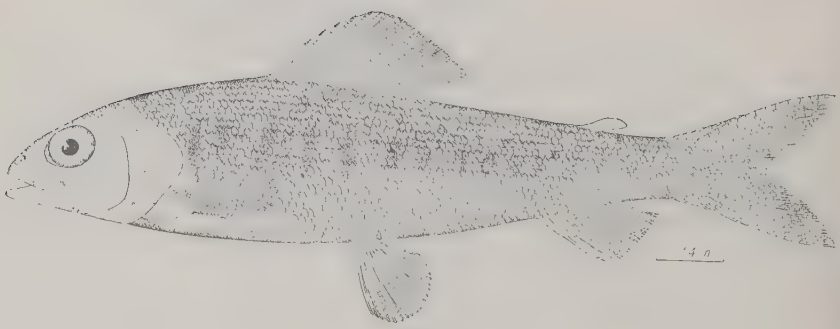

224*a*

223. THYMALLUS TRICOLOR. (Pp. 518, 2871.)
224. THYMALLUS TRICOLOR MONTANUS. (Pp. 519, 2871.)
224*a*. THYMALLUS TRICOLOR MONTANUS; young. (Pp. 519, 2871.)

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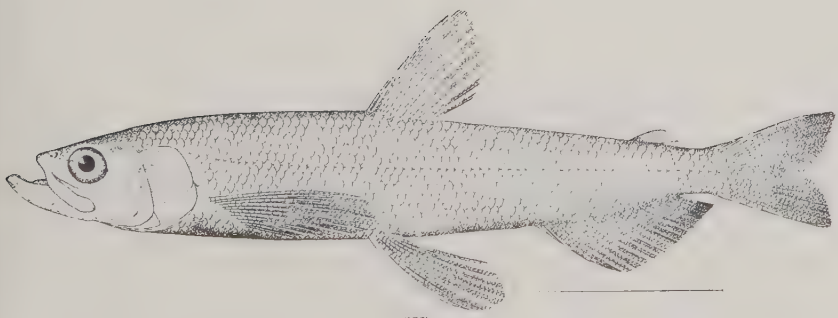
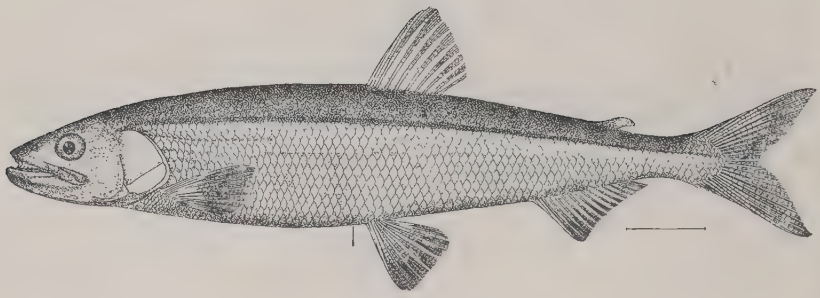
226

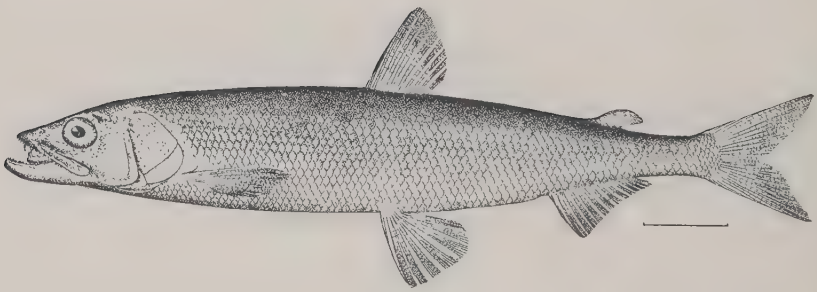


227

225. Mallotus villosus. (P. 520.)
226. Thaleichthys pacificus. (P. 521.)
227. Osmerus thaleichthys. (P. 522.)



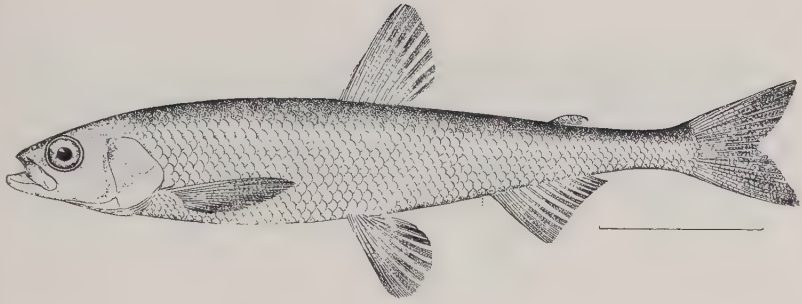
228



229

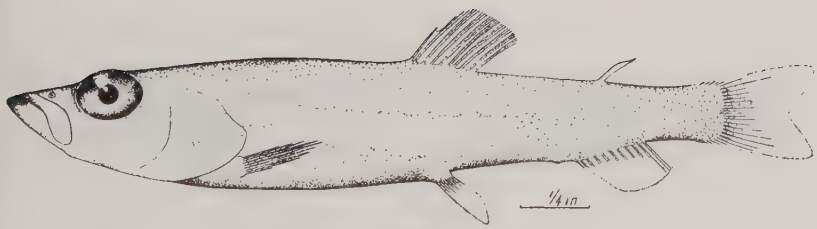
230

228. OSMERUS MORDAX. (P. 523.)
229. OSMERUS DENTEX. (P. 524.)
230. HYPOMESUS PRETIOSUS. (P. 525.)



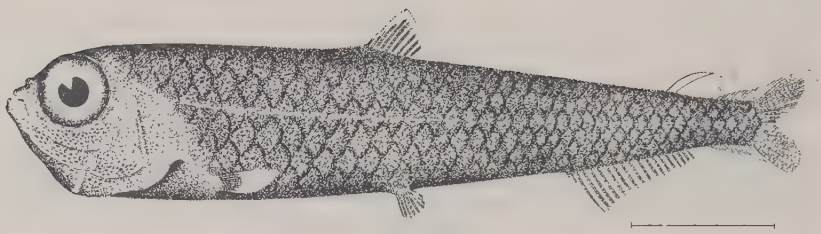
231

232



233

231. HYPOMESUS OLIDUS. (P. 525.)
232. ARGENTINA SILUS. (P. 526.)
233. LEUROGLOSSUS STILBIUS. (P. 527.)



234

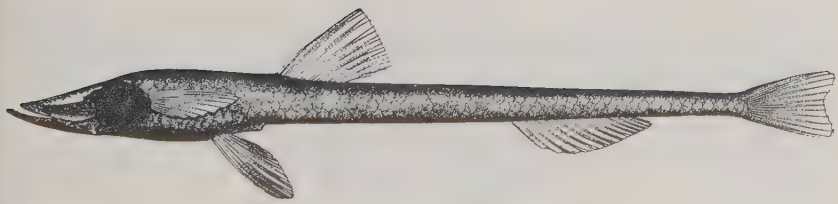
235

236

234. BATHYLAGUS BENEDICTI. (P. 529.)
235. TRACHINOCEPHALUS MYOPS. (P. 533.)
236. SYNODUS FŒTENS. (P. 538.)

237

238

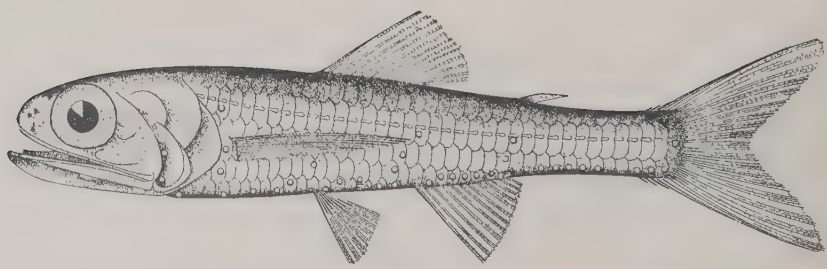


239

237. Benthosaurus grallator. (P. 543.)
238. Bathypterois quadrifilis. (P. 545.)
239. Ipnops murrayi. (P. 547.)

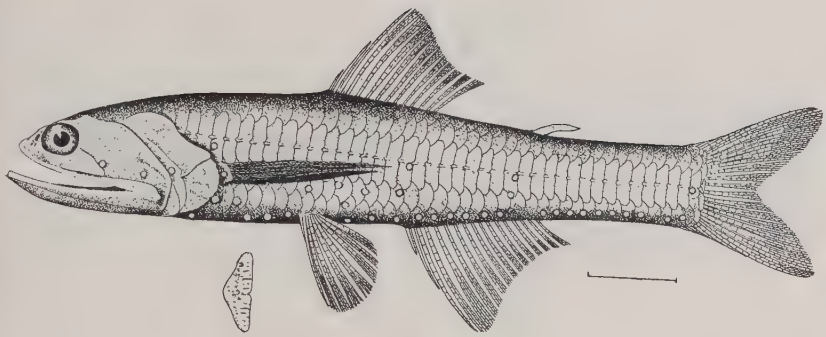
240

241



242

240. Rondeletia bicolor. (P. 548.)
241. Cetomimus gillii. (P. 549.)
242. Ceratoscopelus madeirensis. (P. 557.)



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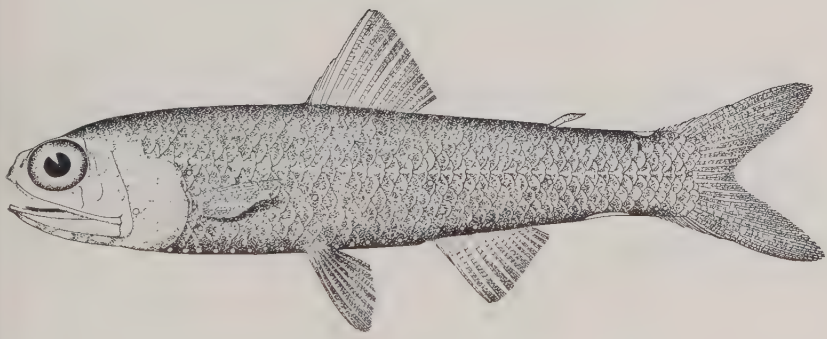
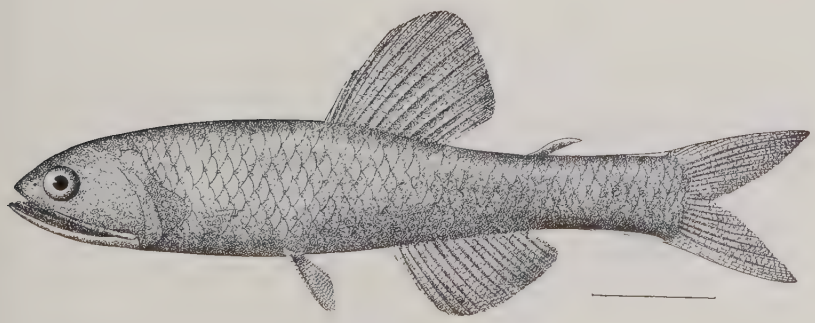


244

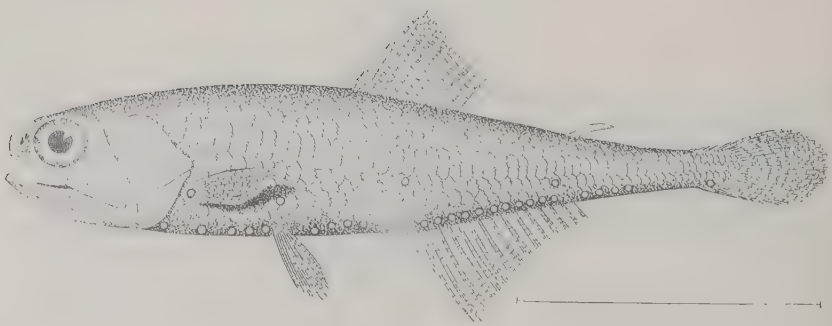


245

243. LAMPANYCTUS CROCODILUS. (P. 558.)
244. LAMPADENA SPECULIGERA. (P. 561.)
245. NANNOBRACHIUM MACDONALDI. (P. 563.)

246

247



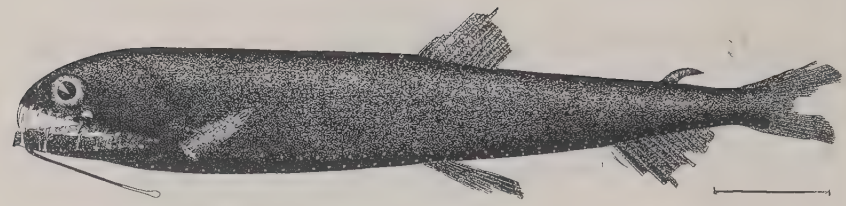
246. ÆTHOPRORA LUCIDA. (P. 565.)
247. MYCTOPHUM OPALINUM. (P. 571.)
248. TARLETONBEANIA TENUA. (P. 575.)

249

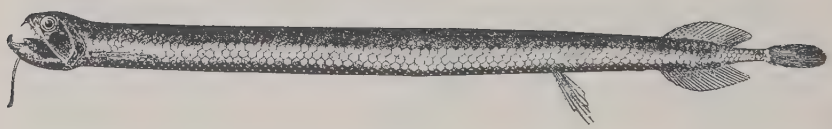
250

251

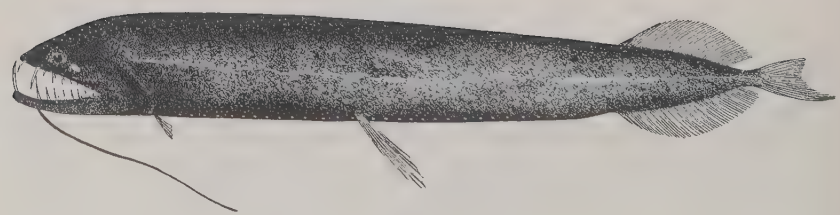
249. YARRELLA BLACKFORDI. (P. 584.)
250. CHAULIODUS SLOANEI. (P. 585.)
251. ASTRONESTHES GEMMIFER. (P. 586.)



252



253



254

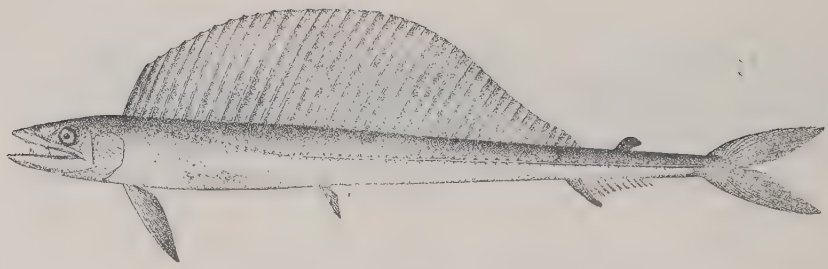
252. ASTRONESTHES RICHARDSONI. (P. 587.)
253. STOMIAS FEROX. (P. 588.)
254. GRAMMATOSTOMIAS DENTATUS. (P. 590.)

255

256

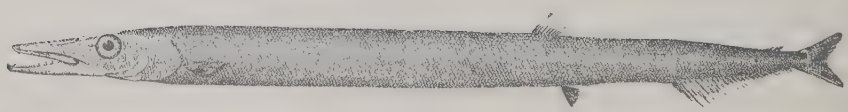
257

255. PHOTONECTES GRACILIS. (P. 591.)
256. MALACOSTEUS NIGER. (P. 593.)
257. ALEPISAURUS FEROX. (P. 595.)



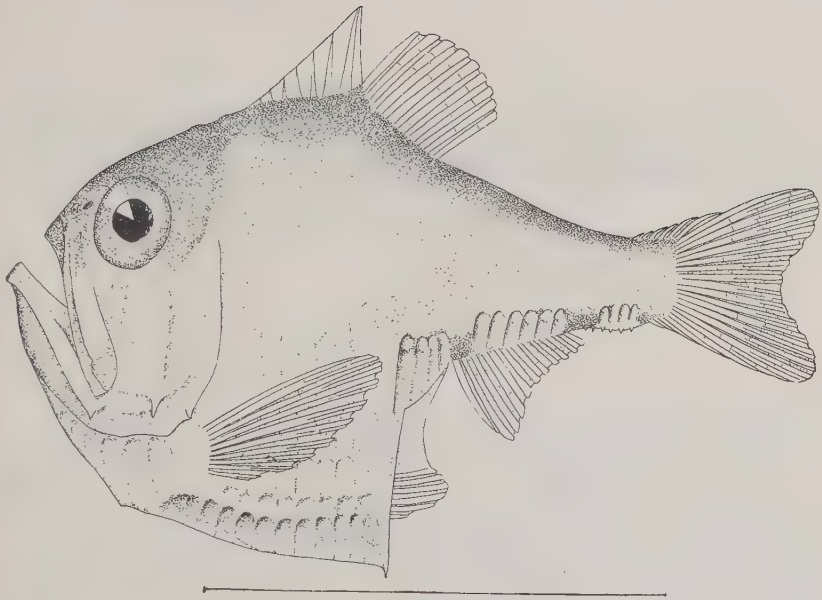
258

259

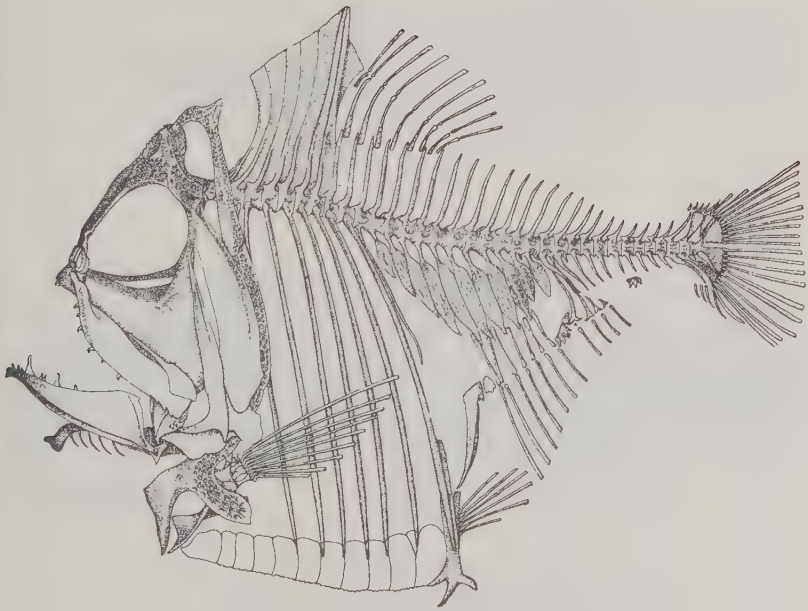


260

258. Alepisaurus æsculapius. (P. 595.)
259. Arctozenus coruscans. (P. 601.)
260. Paralepis coregonoides. (P. 602.)

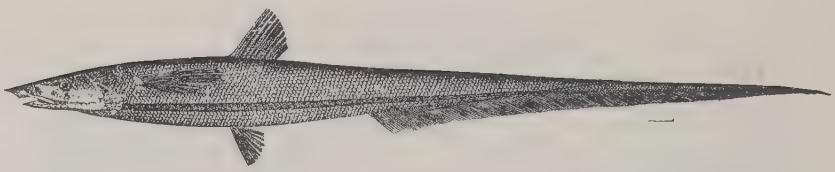


261

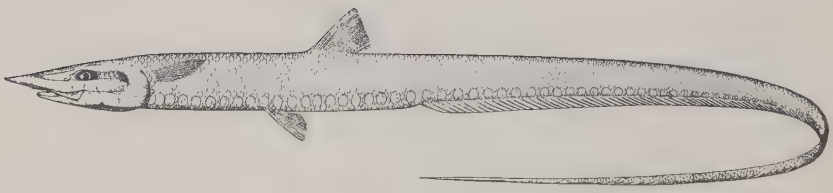


261*a*

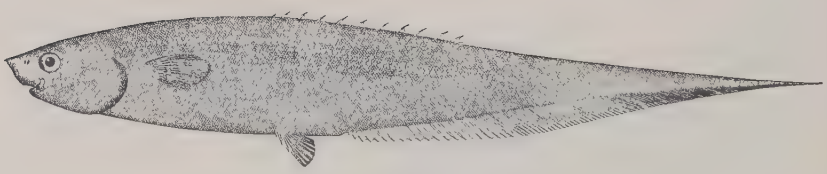
261, 261*a*. ARGYROPELECUS OLFERSI. (P. 604.)



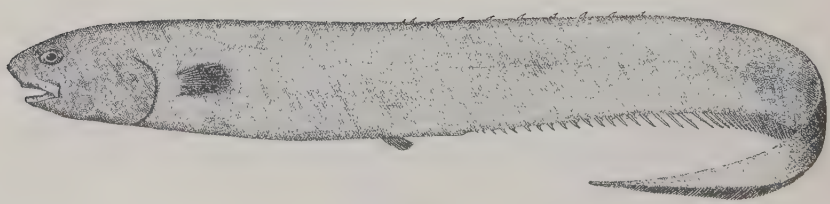
262



263



264

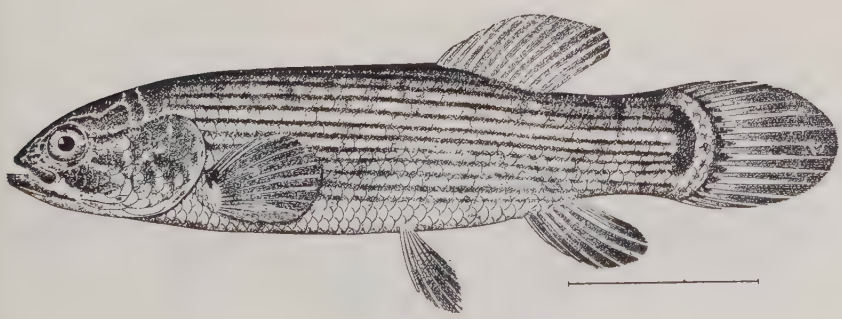


265

262. ALDROVANDIA MACROCHIR. (P. 609.)
263. ALDROVANDIA GRACILIS. (P. 610.)
264. NOTACANTHUS ANALIS. (P. 615.)
265. NOTACANTHUS PHASGANORUS. (P. 616.)

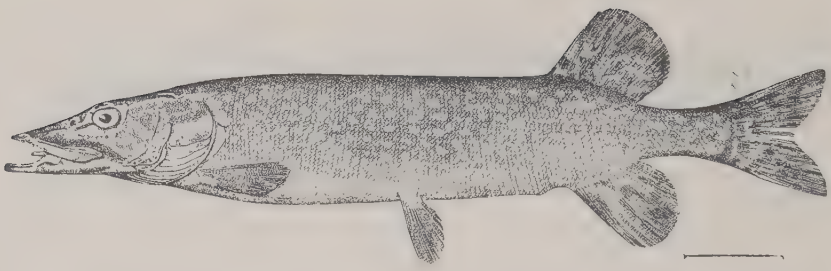
266

267



268

266. LIPOGENYS GILLII. (P. 619.)
267. DALLIA PECTORALIS. (P. 621.)
268. UMBRA PYMÆA. (P. 624.)

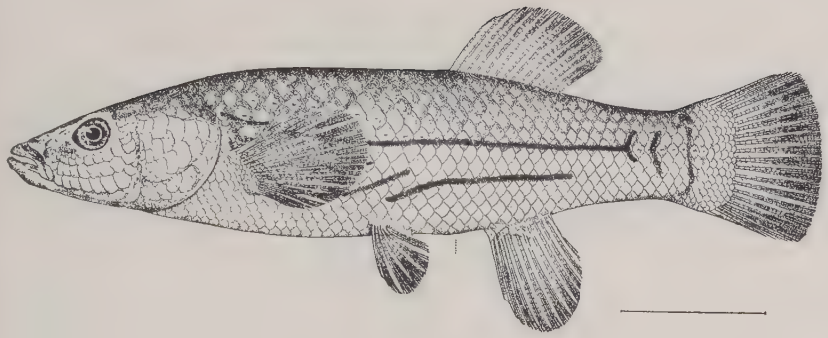


269

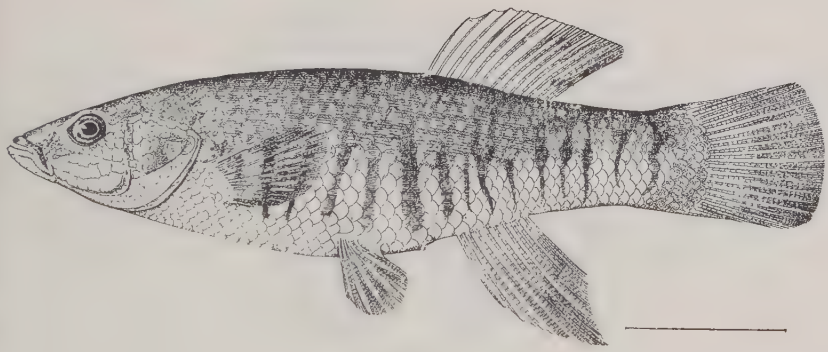
269a

270

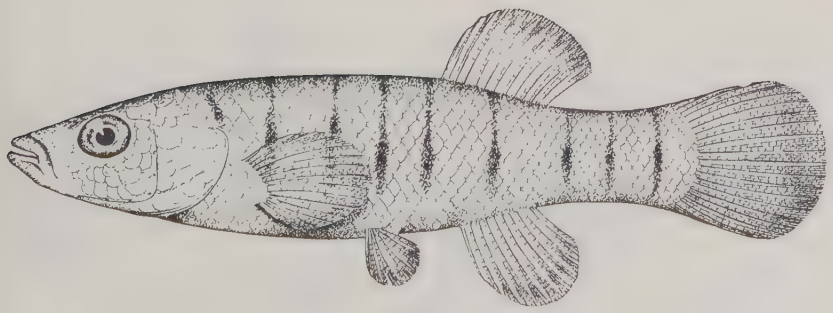
269, 269*a*. LUCIUS LUCIUS. (P. 628.)
270. LUCIUS MASQUINONGY. (P. 629.)



271

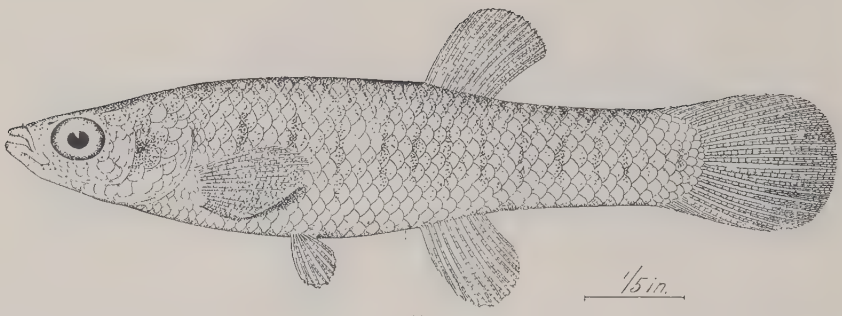


271*a*

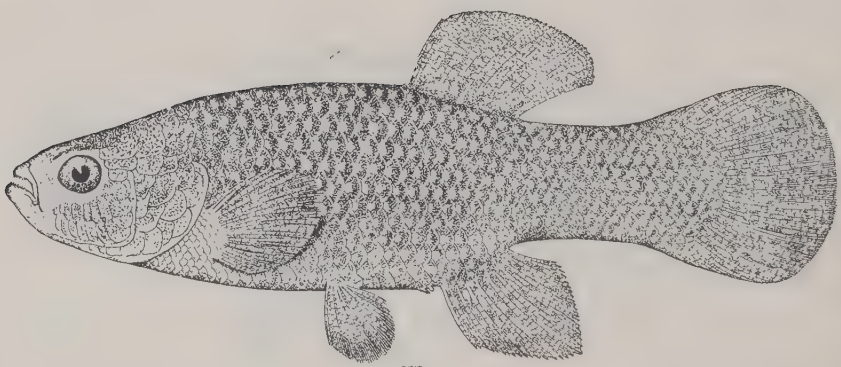


271*b*

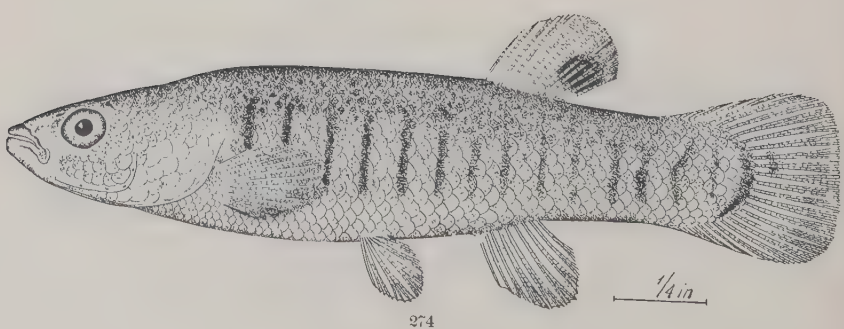
271. FUNDULUS MAJALIS; female. (P. 639.)
271*a*. FUNDULUS MAJALIS; male. (P. 639.)
271*b*. FUNDULUS MAJALIS; young. (P. 639.)



272

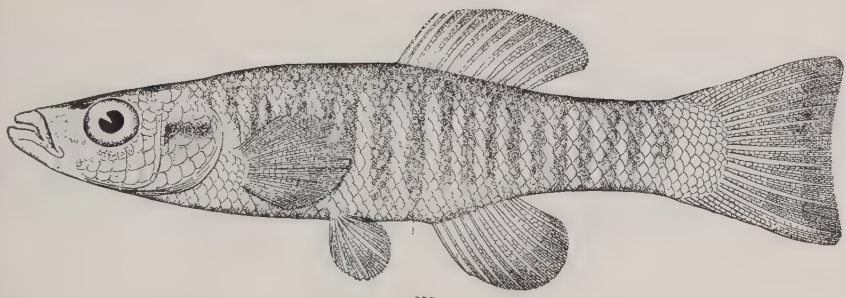


273

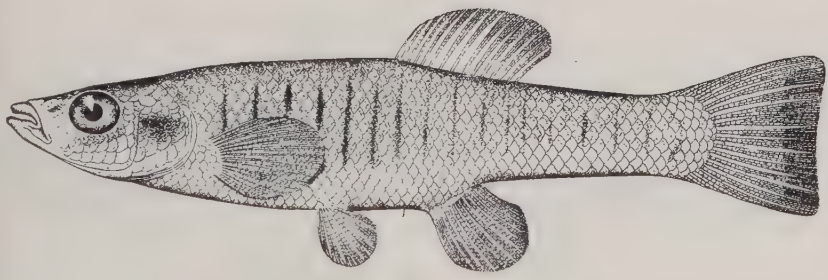


274

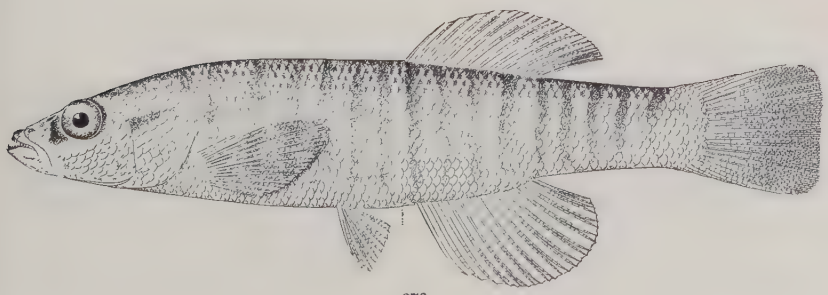
272. FUNDULUS PALLIDUS. (P. 638.)
273. FUNDULUS HETEROCLITUS; male. (P. 640.)
274. FUNDULUS OCELLARIS. (P. 642.)



275

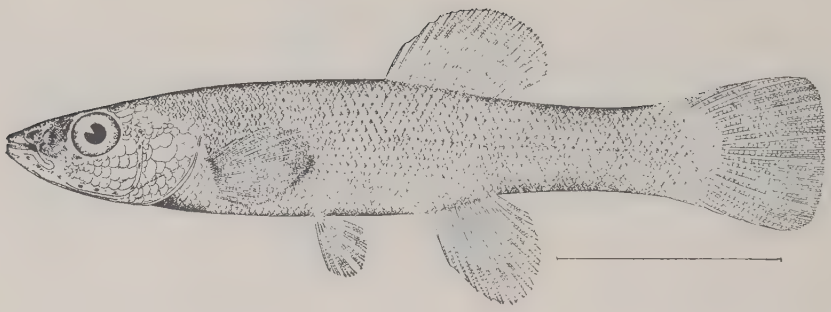


275*a*

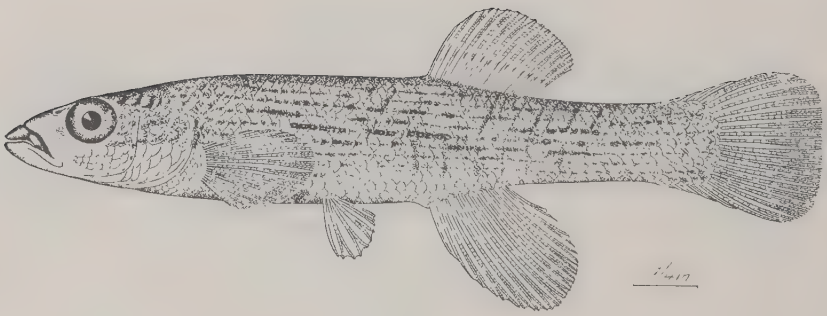


276

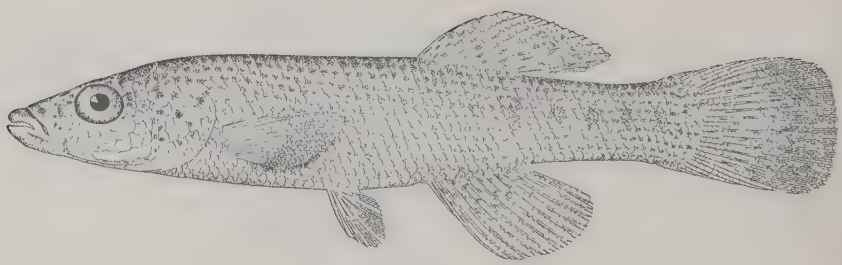
275. FUNDULUS DIAPHANUS; male. (P. 645.)
275*a*. FUNDULUS DIAPHANUS; female. (P. 645.)
276. FUNDULUS ZEBRINUS. (P. 646.)



277

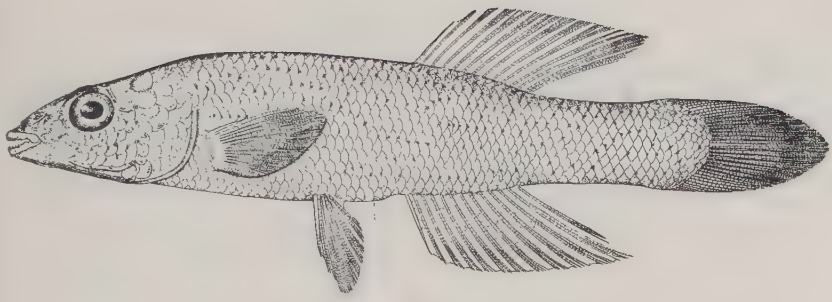


278

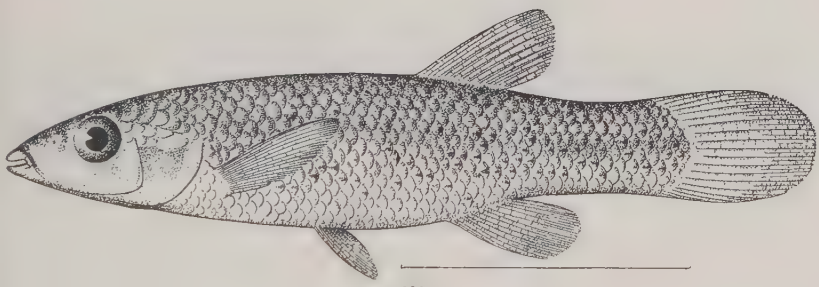


278*a*

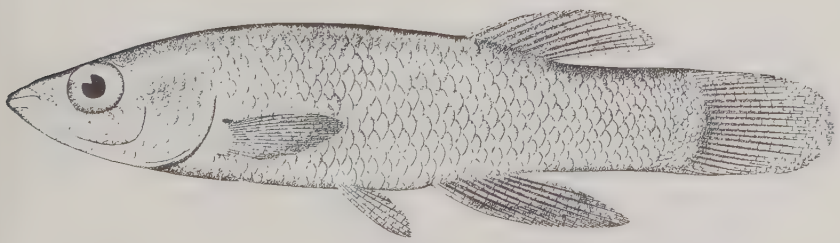
277. FUNDULUS SEMINOLIS. (P. 647.)
278. FUNDULUS CATENATUS; male. (P. 648.)
278*a*. FUNDULUS CATENATUS; female? (P. 648.)



279

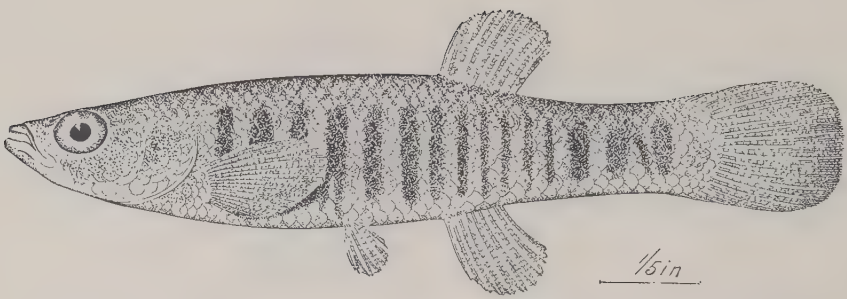


280

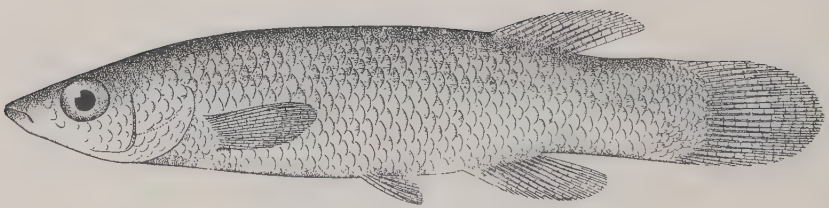


281

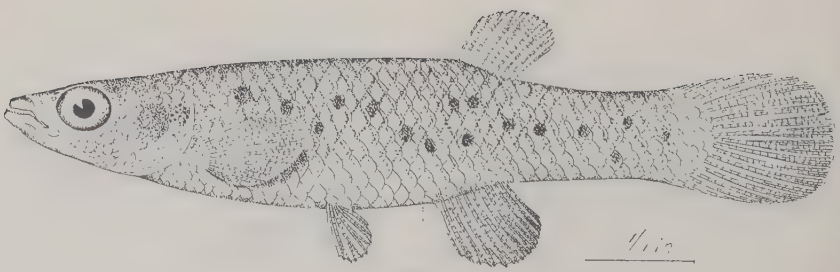
279. FUNDULUS STELLIFER. (P. 648.)
280. FUNDULUS RATHBUNI. (P. 649.)
281. FUNDULUS ALBOLINEATUS. (P. 649.)



282

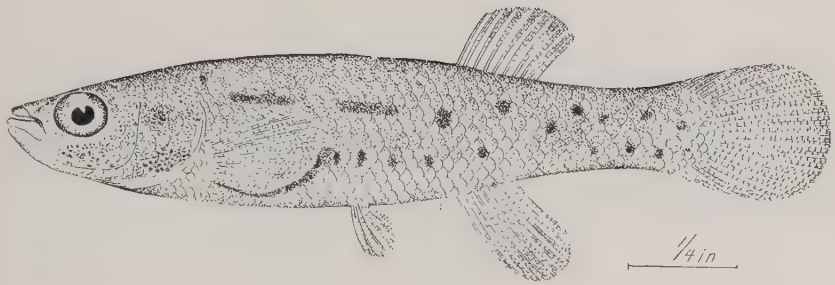


283



284

282. FUNDULUS FUNDULOIDES. (P. 650.)
283. FUNDULUS MACDONALDI. (P. 651.)
284. FUNDULUS JENKINSI. (P. 651.)



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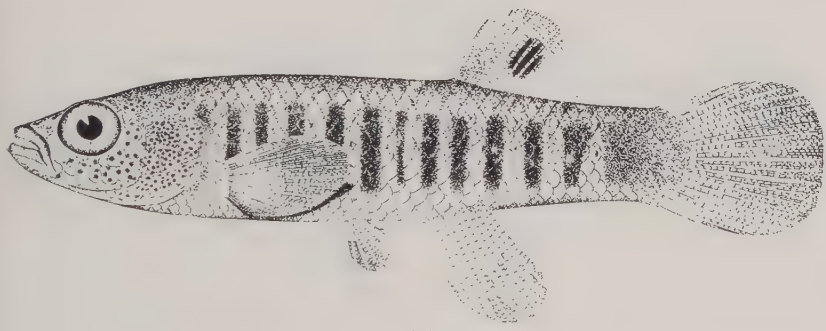
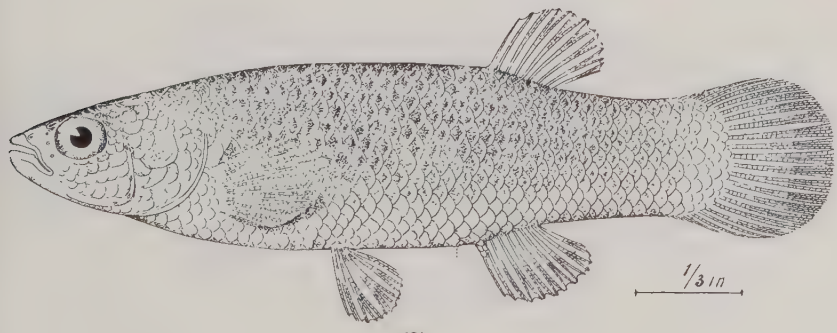
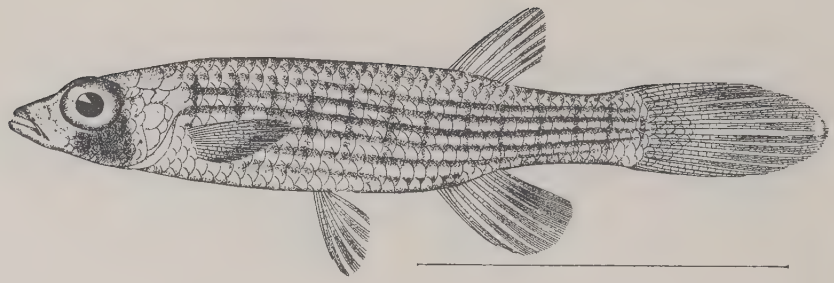


286

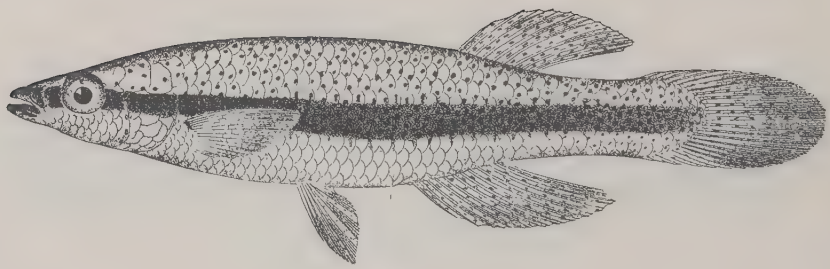


287

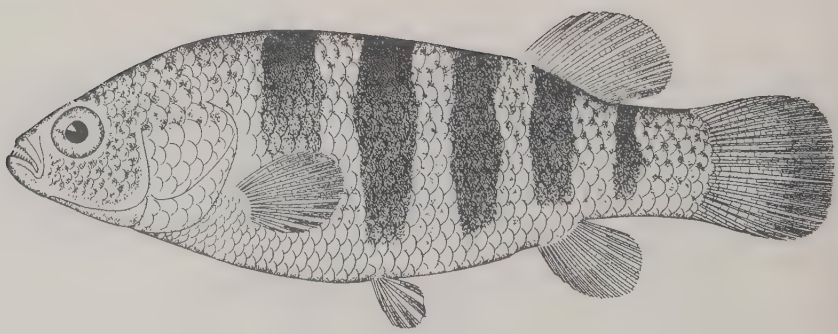
285. FUNDULUS PULVEREUS. (P. 652.)
286. FUNDULUS LUCIÆ. (P. 654.)
287. FUNDULUS CHRYSOTUS. (P. 655.)



288



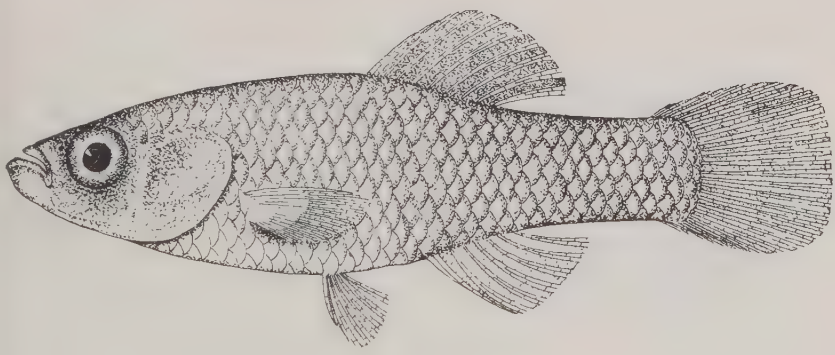
289



290

288. FUNDULUS NOTTII. (P. 656.)
289. FUNDULUS NOTATUS. (P. 659.)
290. ADINIA DUGESII. (P. 661.)

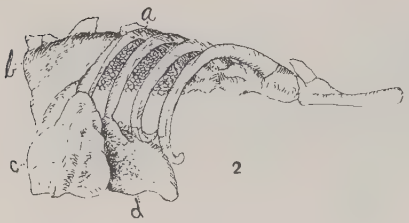
291



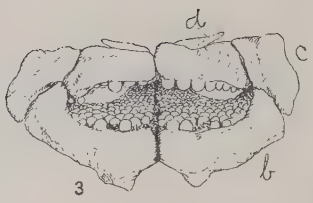
292

293

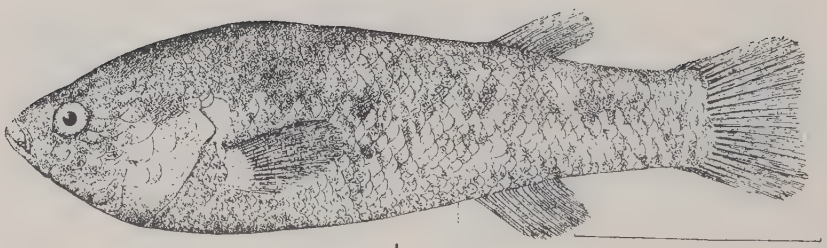
291. FUNDULUS GOODEI. (Pp. 664, 2831.)
292. LUCANIA PARVA. (P. 665.)
293. CHARACODON BILINEATUS. (P. 668.)



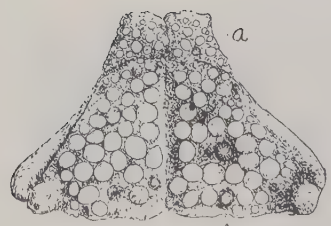
294*a*



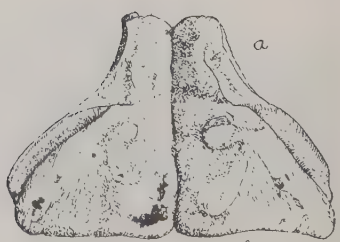
294*b*



294

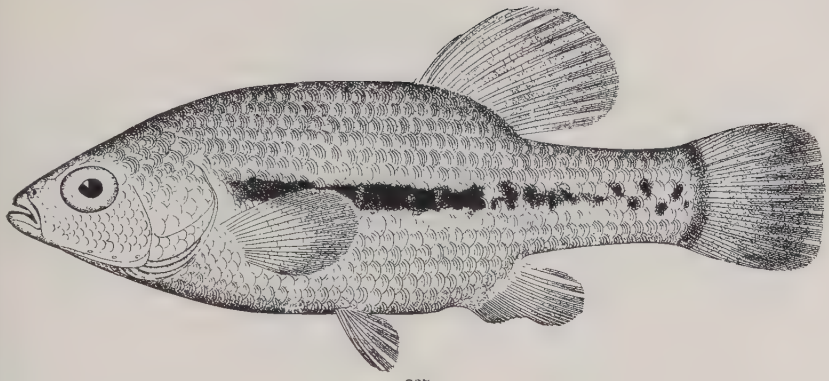


294*c*

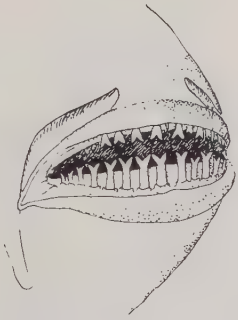


294*d*

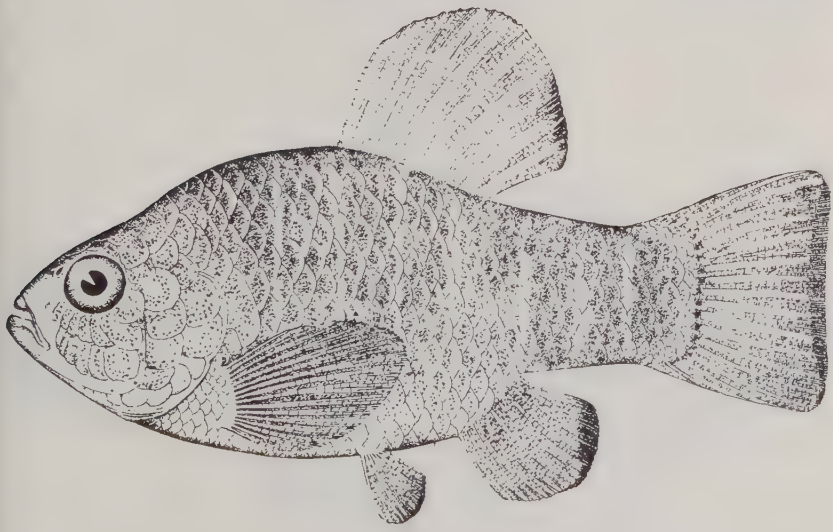
294, 294*a*, 294*b*, 294*c*, 294*d*. EMPETRICHTHYS MERRIAMI. (P. 667.)



295

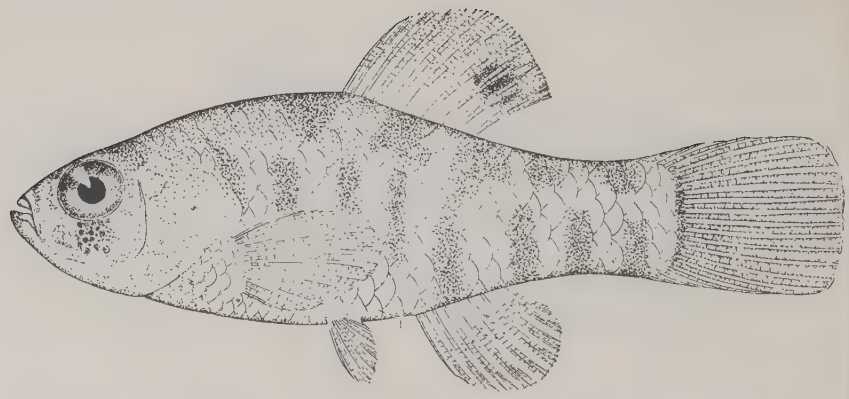


295*a*

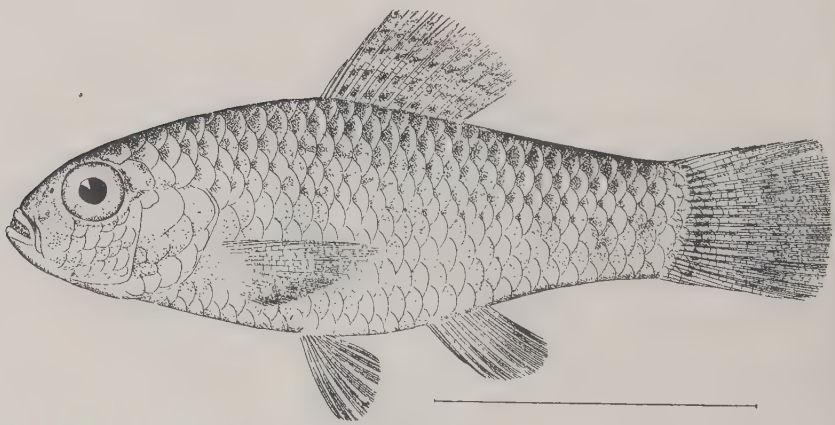


296

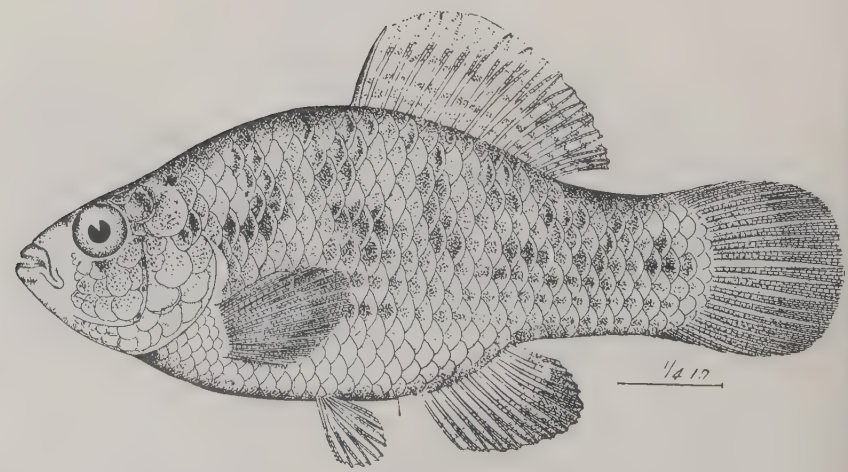
295. Characodon variatus. (P. 669.)
295*a*. Teeth of Characodon variatus. (P. 669.)
296. Cyprinodon variegatus. (P. 671.)



296*a*

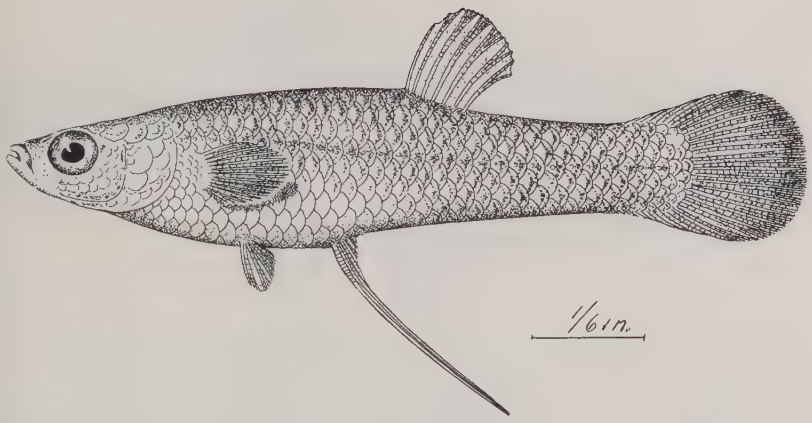


297

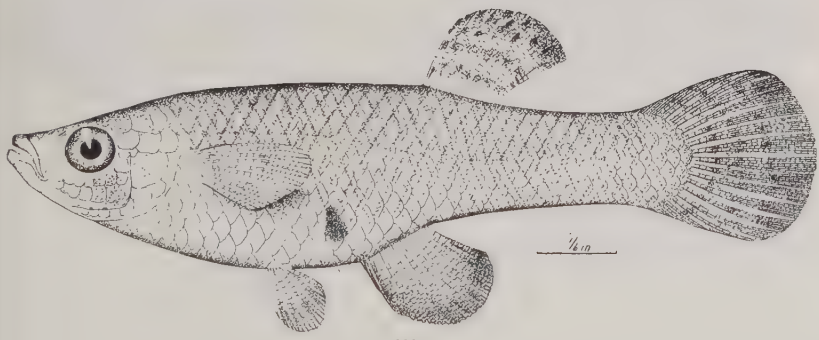


298

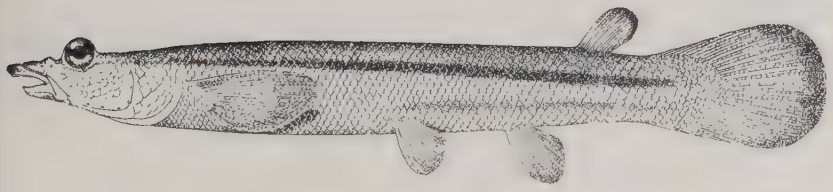
296*a*. CYPRINODON VARIEGATUS; young. (P. 671.)
297. CYPRINODON CARPIO. (P. 675.)
298. JORDANELLA FLORIDÆ. (P. 677.)



299

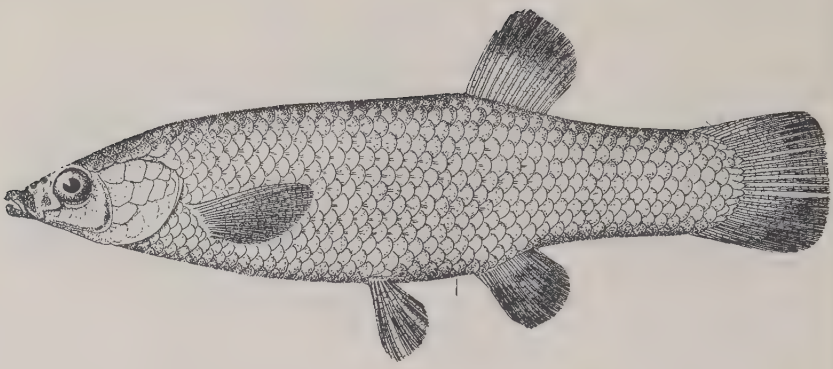


299*a*

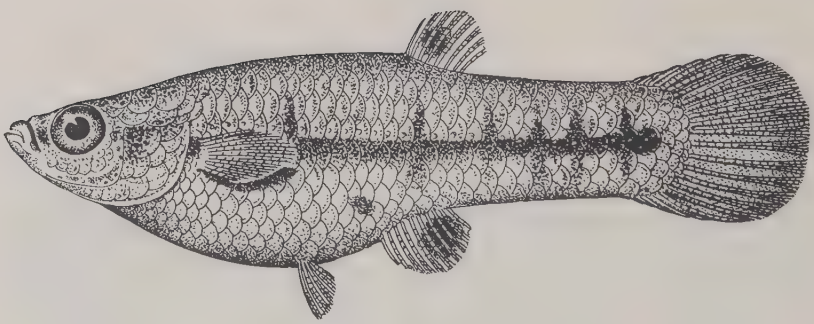


300

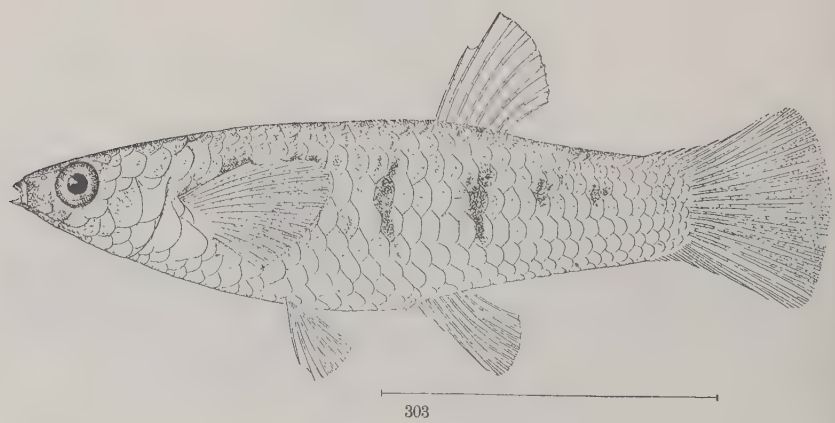
299. GAMBUSIA AFFINIS; male. (P. 680.)
299*a*. GAMBUSIA AFFINIS; female. (P. 680.)
300. ANABLEPS DOVII. (P. 685.)



301

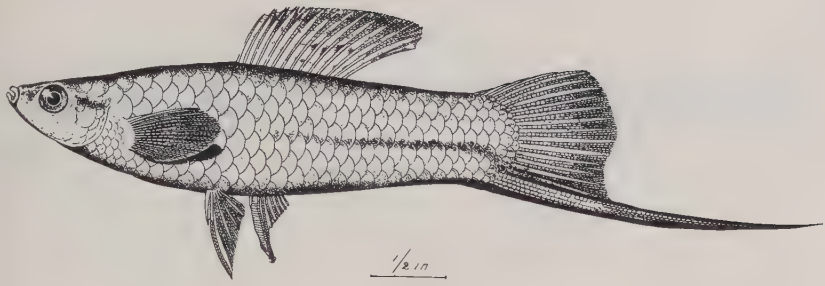


302

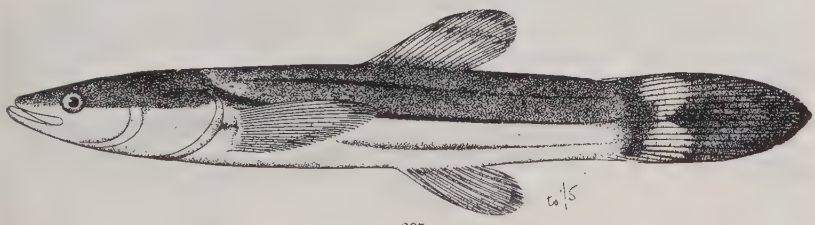


303

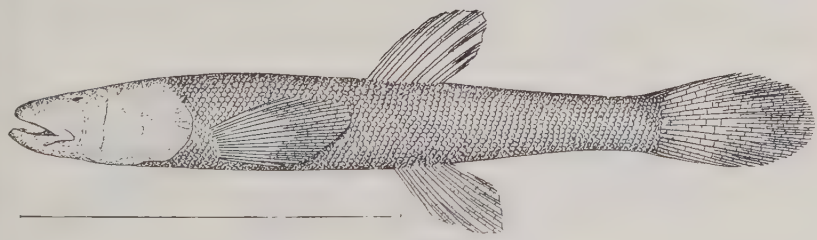
301. Goodea atripinnis. (P. 685.)
302. Heterandria formosa. (P. 687.)
303. Pœcilia presidionis; female. (P. 697.)



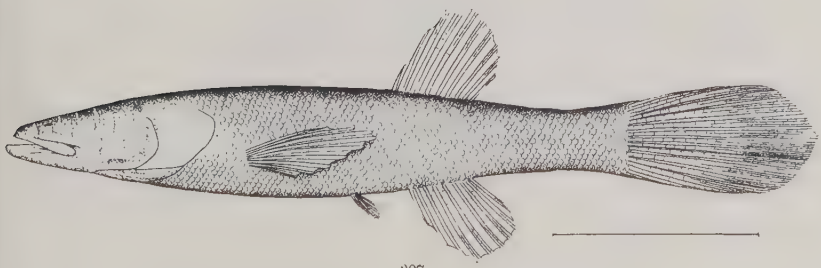
304



305

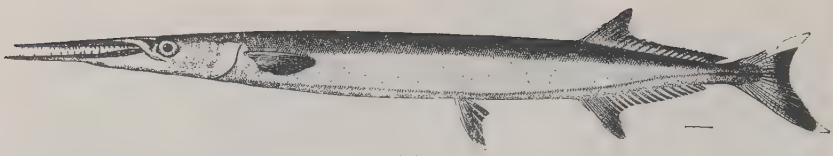


306



307

304. Xiphophorus helleri. (P. 701.)
305. Chologaster cornutus. (P. 703.)
306. Typhlichthys subterraneus. (P. 704.)
307. Amblyopsis spelæus. (P. 706.)



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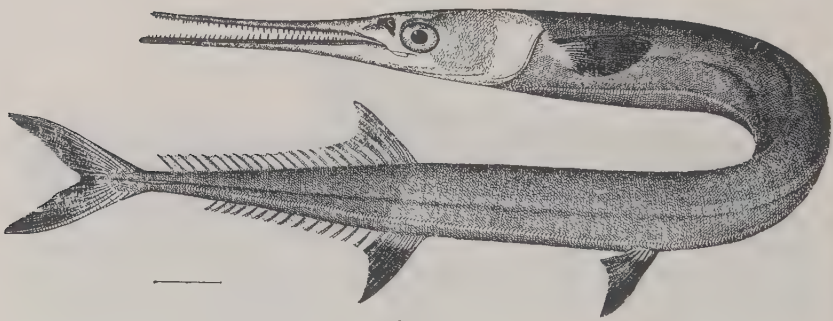


309

310

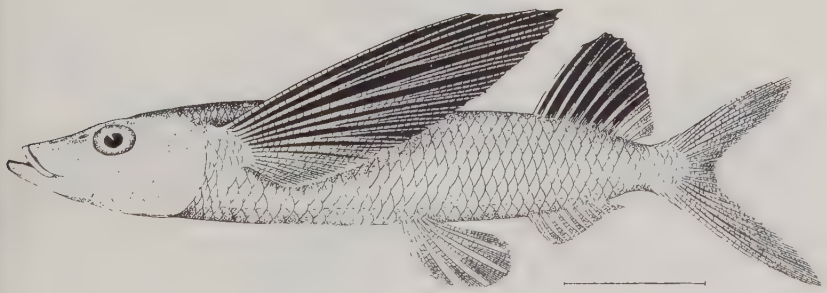
311

308. TYLOSURUS RAPHIDOMA. (P. 715.)
309. TYLOSURUS ACUS. (P. 716.)
310. CHRIODORUS ATHERINOIDES. (P. 719.)
311. HYPORHAMPHUS UNIFASCIATUS. (P. 720.)

312

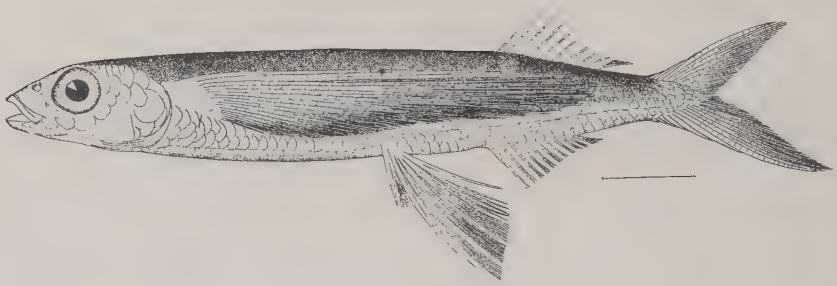
313

314



315

312. Hyporhamphus roberti. (P. 721.)
313. Hemiramphus brasiliensis. (P. 722.)
314. Scombresox saurus. (P. 725.)
315. Fodiator acutus. (P. 728.)

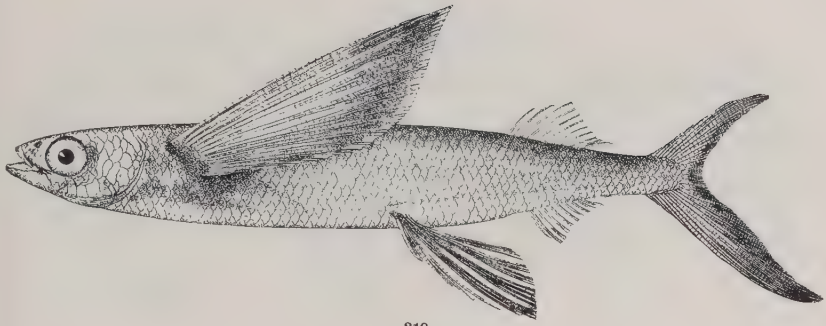


316

317

318

316. EXONAUTES EXSILIENS. (Pp. 732, 2830.)
317. EXONAUTES RONDELETII. (Pp. 733, 2830.)
318. EXOCŒTUS VOLITANS. (P. 734.)



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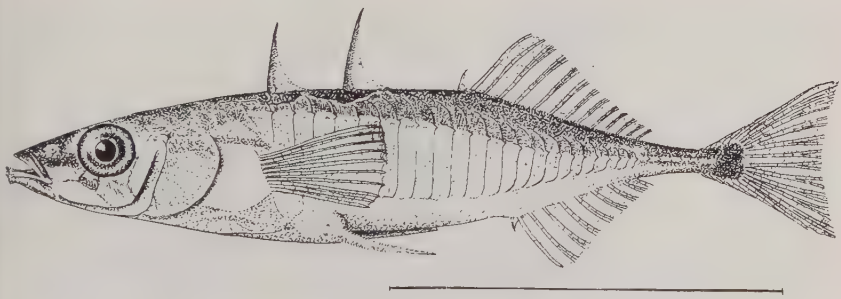
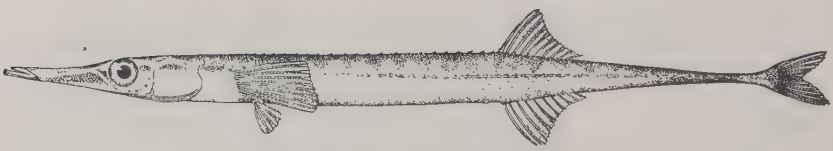


320

321

319. Cypsilurus californicus. (Pp. 740, 2830.)
320. Gasterosteus aculeatus. (P. 747.)
321. Gasterosteus cataphractus. (P. 749.)

322



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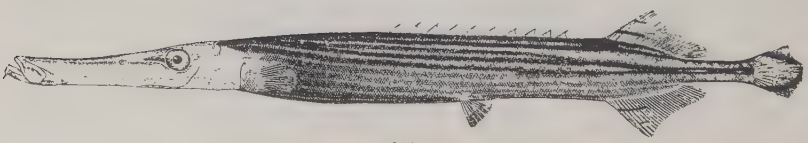
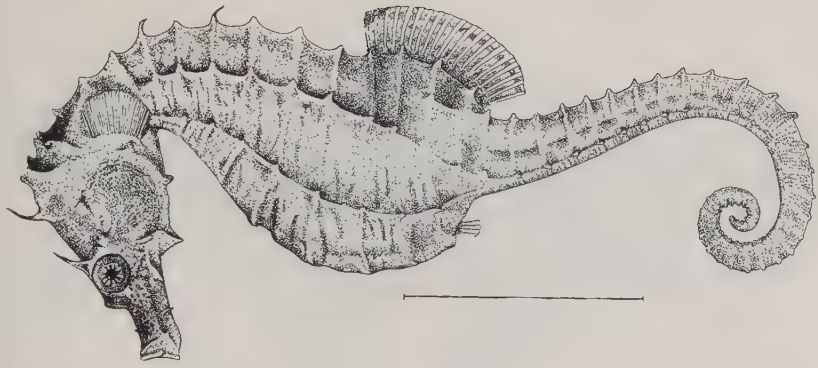


324

325

326

322. APELTES QUADRACUS. (P. 752.)
323. AULORHYNCHUS FLAVIDUS. (P. 754.)
324. AULOSTOMUS MACULATUS. (P. 754.)
325. SIPHOSTOMA STARKSII. (P. 771.)
326. CORYTHROICHTHYS CAYORUM. (P. 2838.)

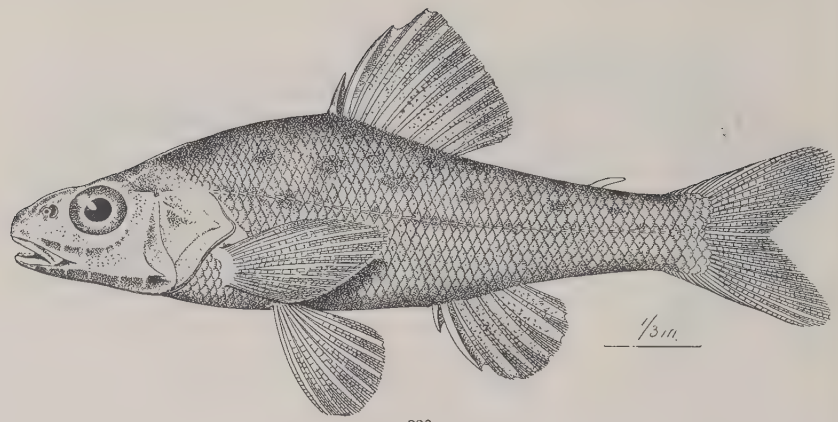


327

328

329

327. HIPPOCAMPUS HUDSONIUS. (P. 777.)
328. HIPPOCAMPUS ZOSTERÆ. (P. 778.)
329. PERCOPSIS GUTTATUS. (P. 784.)



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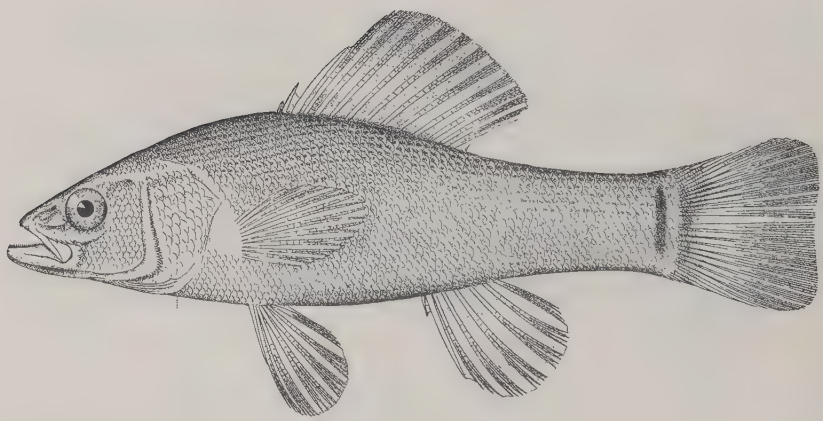

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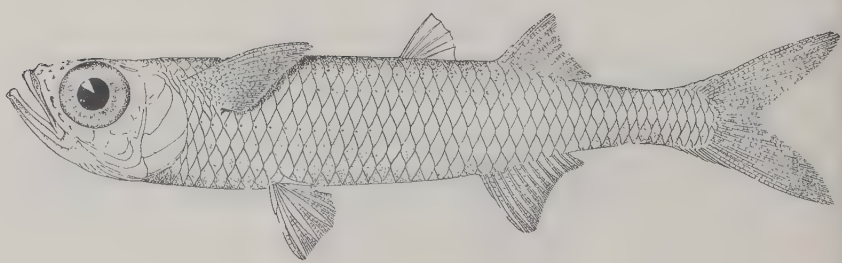
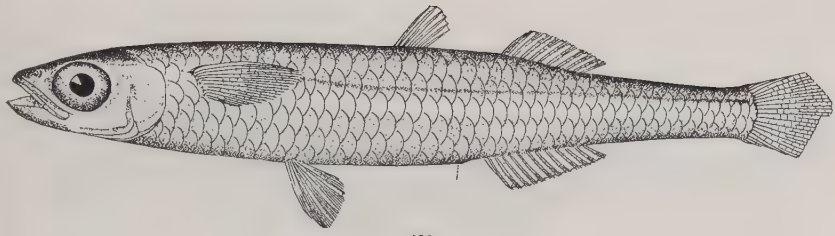


332

330. COLUMBIA TRANSMONTANA. (P. 784.)
331. APHREDODERUS SAYANUS. (P. 786.)
332. ATHERINA STIPES. (P. 790.)



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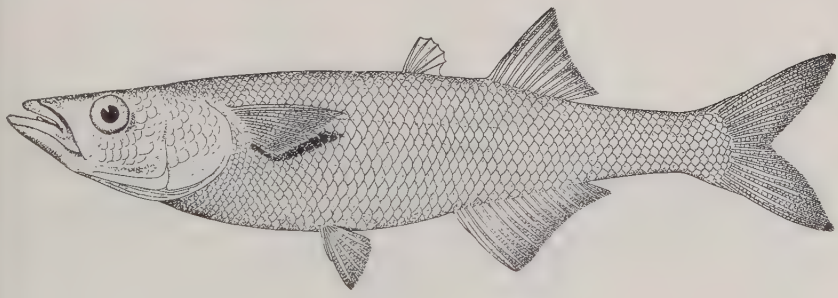

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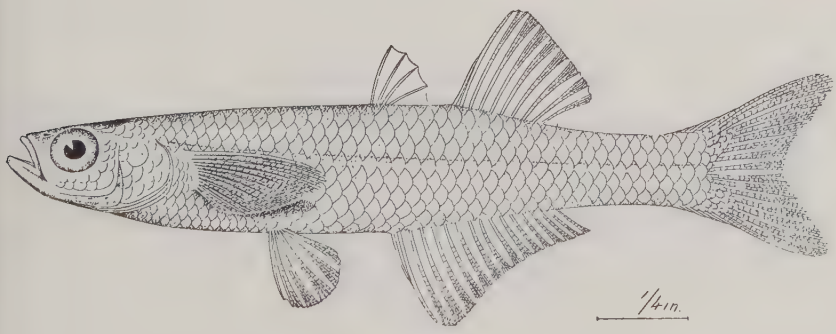
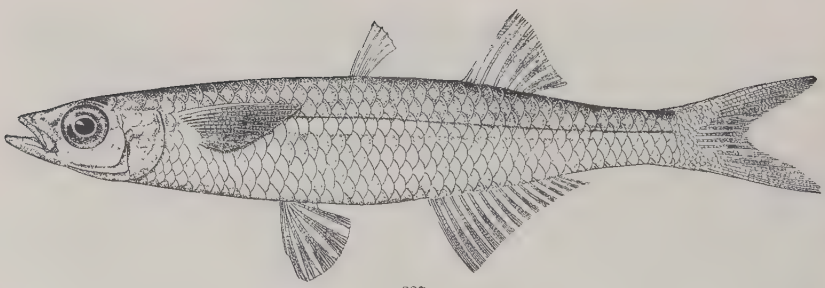


335

333. ATHERINA ARÆA. (P. 790.)
334. CHIROSTOMA HUMBOLDTIANUM. (P. 793.)
335. ESLOPSARUM JORDANI. (Pp. 793, 2840.)

336



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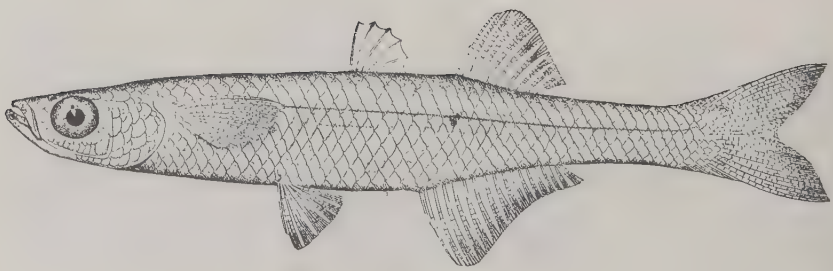
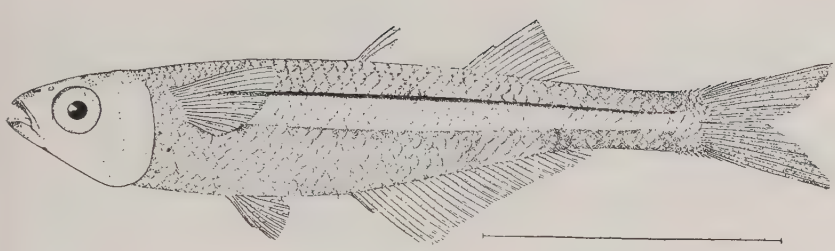


338

336. KIRTLANDIA VAGRANS. (P. 794.)
337. MENIDIA PENINSULÆ. (P. 797.)
338. MENIDIA GRACILIS BERYLLINA. (P. 797.)



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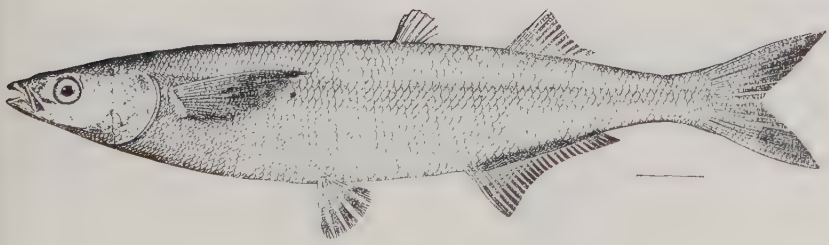
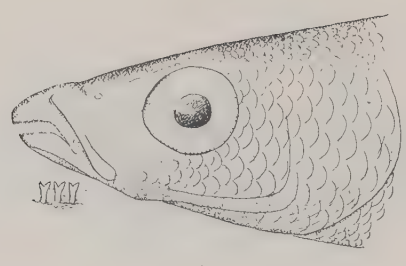
340

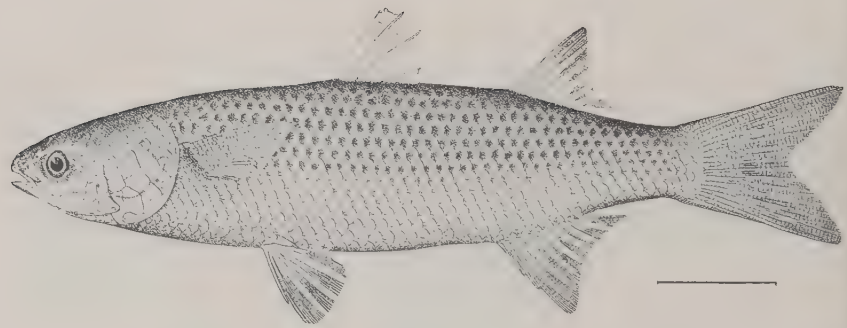


341

339. Eurystole eriarcha. (P. 803.)
340. Thyrina evermanni. (P. 804.)
341. Atherinopsis californiensis. (P. 806.)



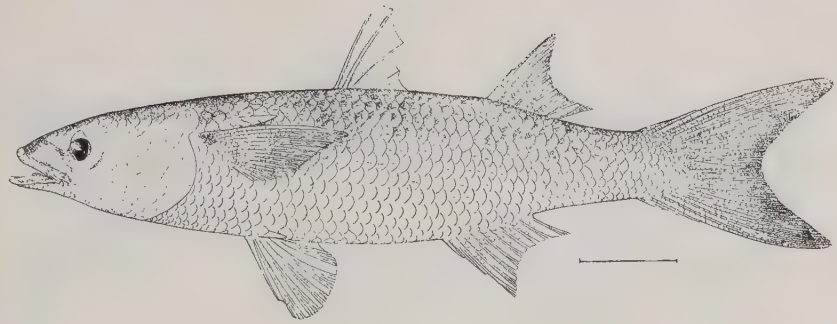
342



343

344

342. Atherinops affinis. (P. 807.)
343. Mugil cephalus. (P. 811.)
344. Mugil curema. (P. 813.)

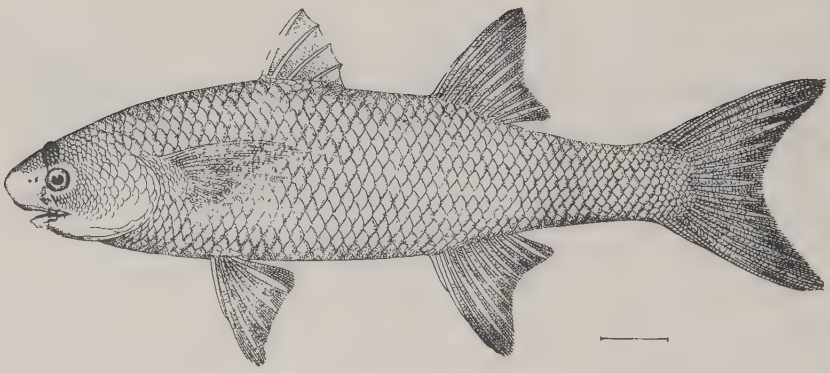


345

346

347

345. MUGIL HOSPES. (P. 814.)
346. CHÆNOMUGIL PROBOSCIDEUS. (P. 816.)
347. AGONOSTOMUS MONTICOLA. (P. 819.)



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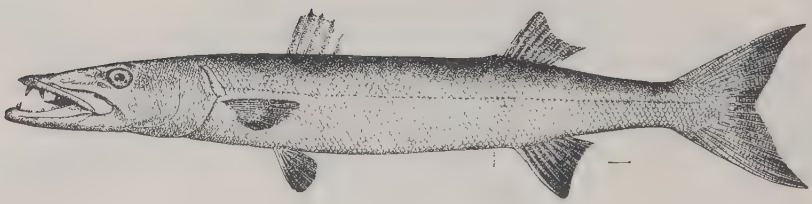
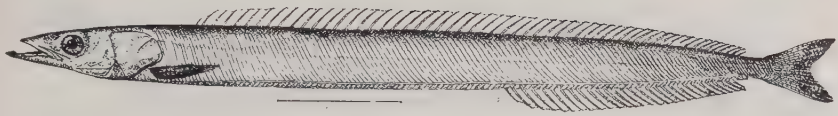


349

350

348. JOTURUS PICHARDI. (P. 821.)
349. SPHYRÆNA BARRACUDA. (Pp. 823, 2841.)
350. POLYDACTYLUS OCTONEMUS. (P. 830.)



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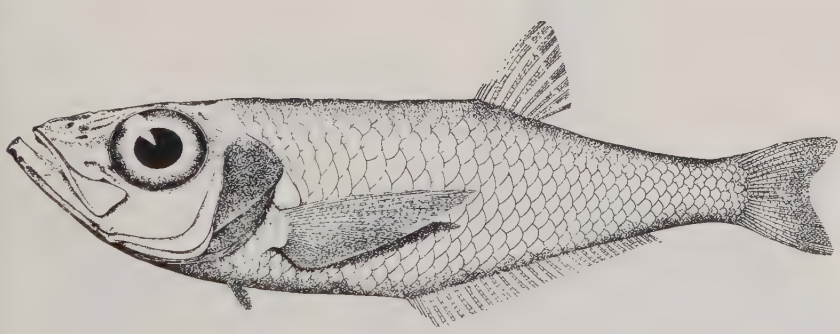
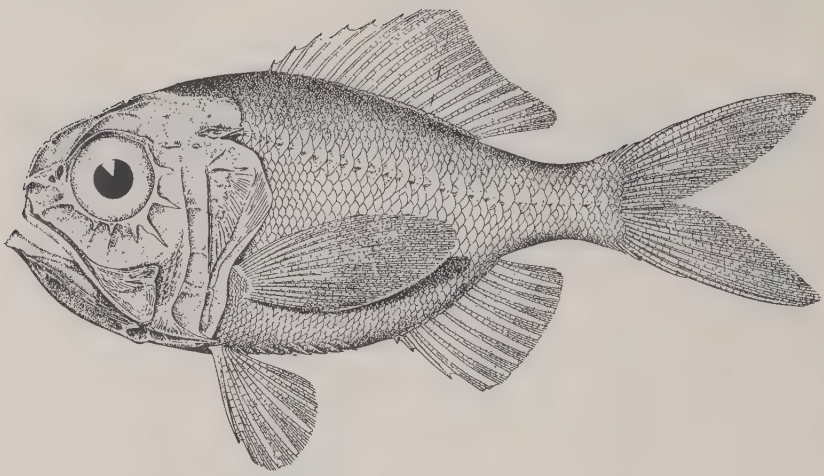


352

353

351. Ammodytes americanus. (P. 833.)
352. Bathyclupea argentea. (P. 835.)
353. Stephanoberyx monæ. (P. 836.)



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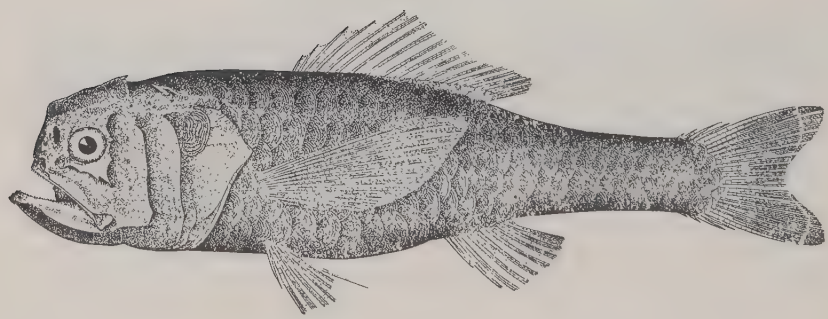

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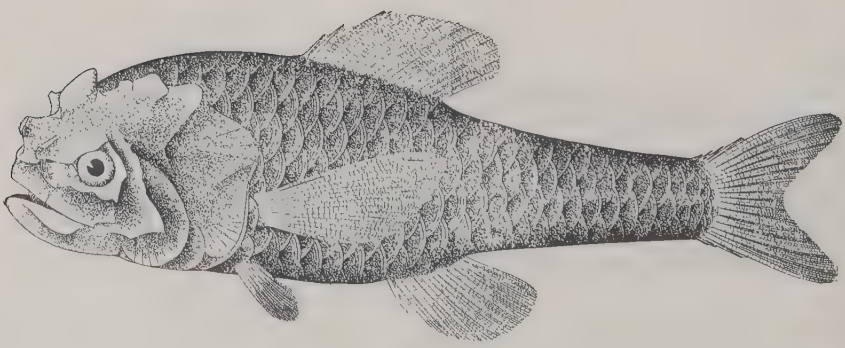
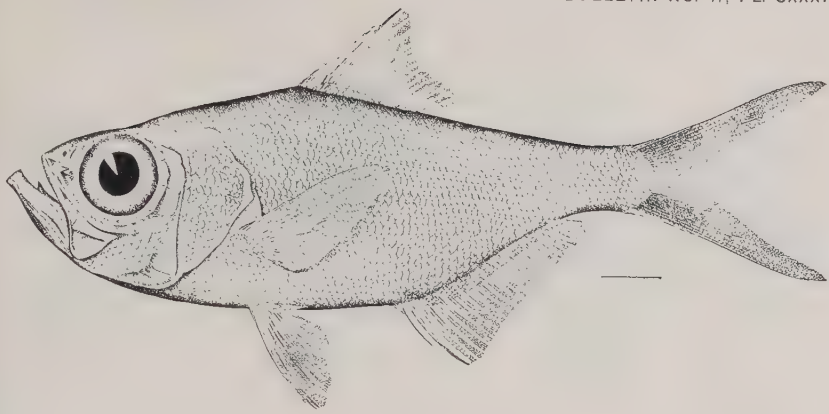


356

354. HOPLOSTETHUS MEDITERRANEUS. (P. 837.)
355. PLECTROMUS SUBORBITALIS. (P. 841.)
356. PLECTROMUS CRASSICEPS. (P. 843.)



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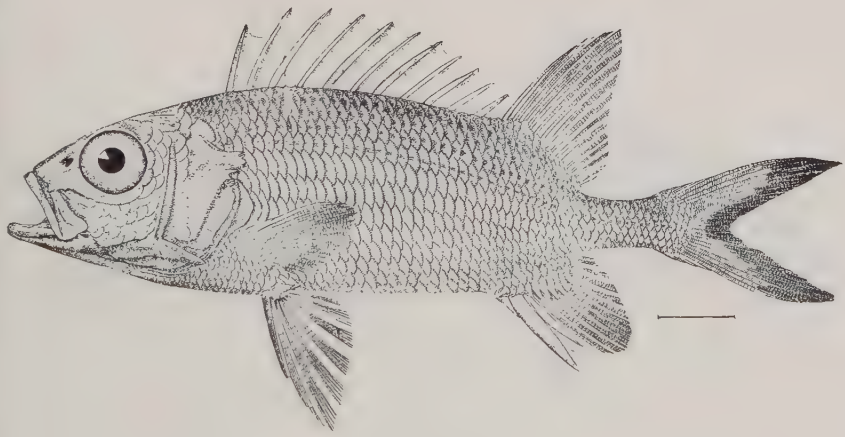

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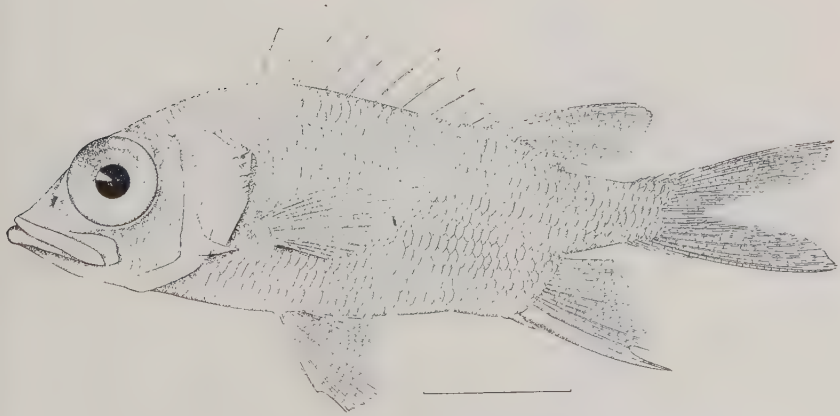
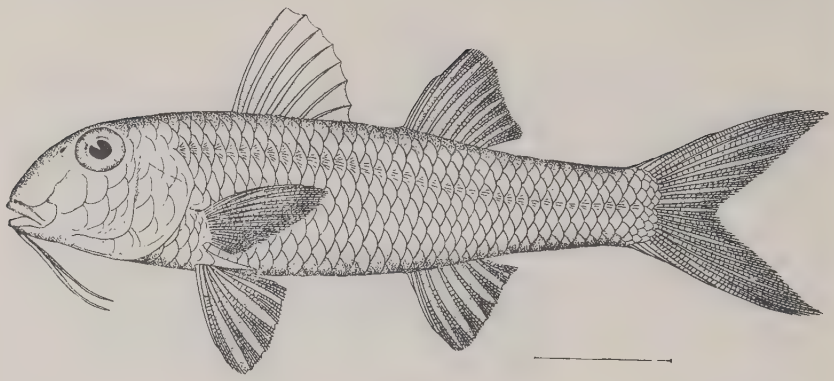


359

357. Beryx splendens. (P. 844.)
358. Holocentrus ascensionis. (P. 848.)
359. Flammeo marianus. (Pp. 852, 2871.)



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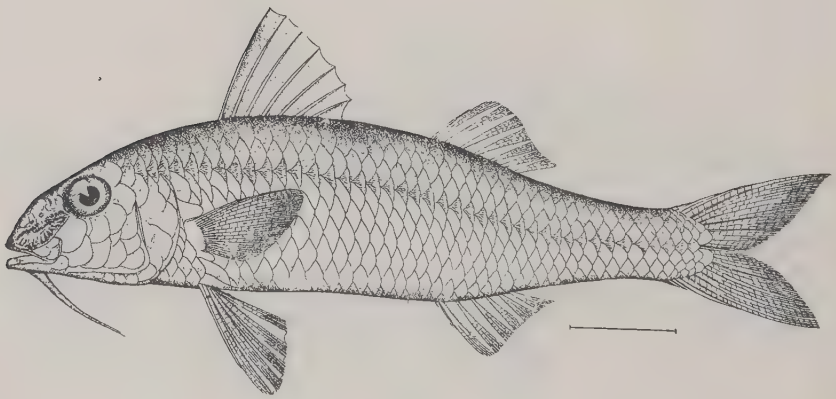

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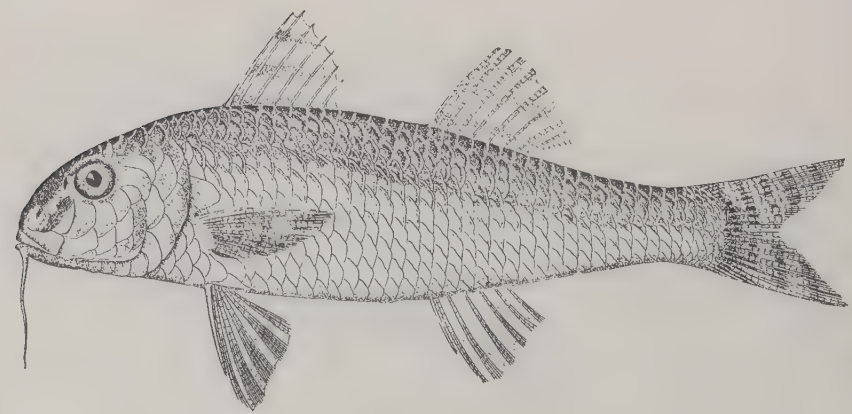

362

360. MULLUS AURATUS. (P. 856.)
361. MULLOIDES RATHBUNI. (P. 857.)
362. UPENEUS MACULATUS. (P. 858.)

363

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365

363. SCOMBER SCOMBRUS. (P. 865.)
364. SCOMBER COLIAS. (P. 866.)
365. AUXIS THAZARD. (P. 867.)

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366. GYMNOSARDA ALLETERATA. (P. 869.)
367. GERMO ALALUNGA. (P. 871.)
368. SCOMBEROMORUS MACULATUS. (P. 874.)

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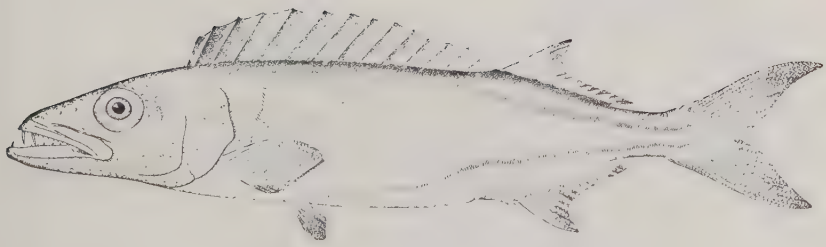
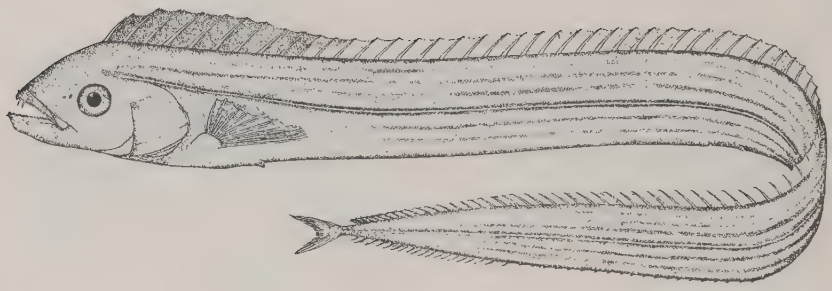


371

369. Scomberomorus regalis. (P. 875.)
370. Escolar violaceus. (Pp. 878, 2843.)
371. Epinnula magistralis. (P. 880.)



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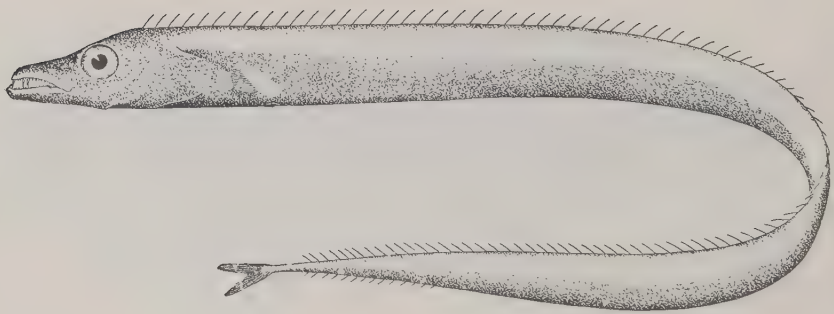

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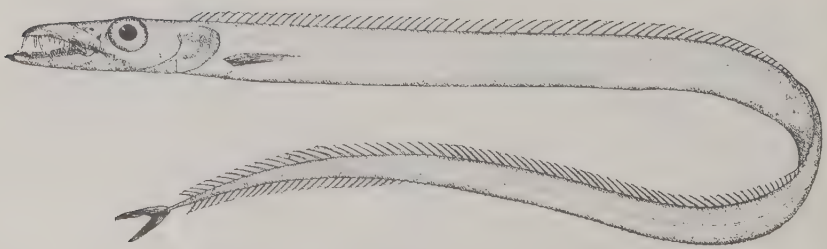
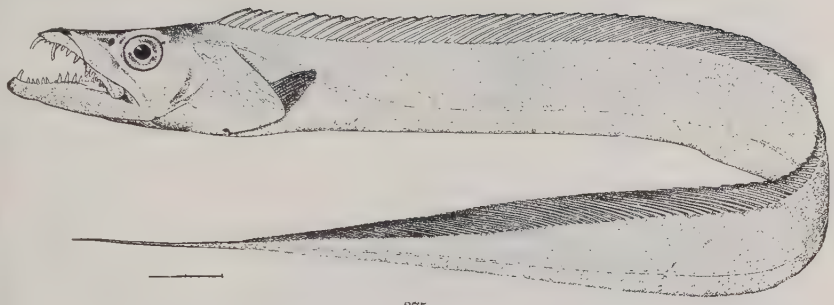


374

372. Evoxymetopon tæniatus. (P. 886.)
373. Lepidopus caudatus. (P. 886.)
374. Benthodesmus atlanticus. (P. 887.)



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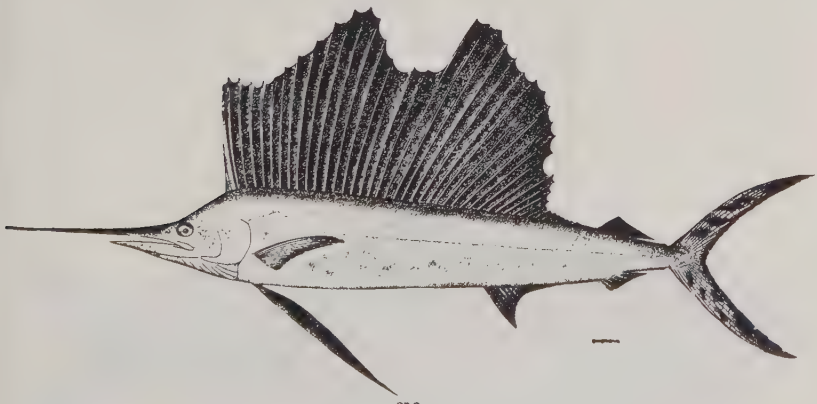
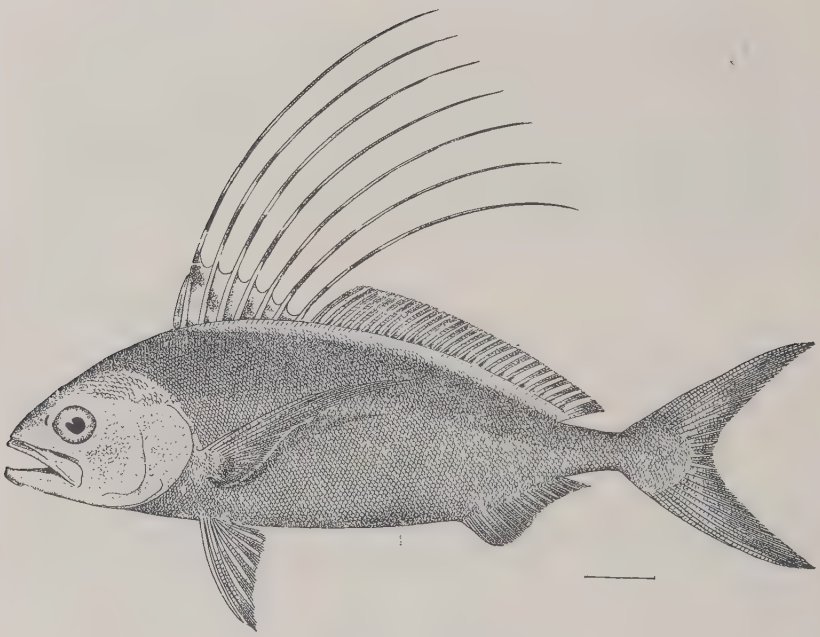


376

375. TRICHIURUS LEPTURUS. (P. 889.)
376. ISTIOPHORUS NIGRICANS. (P. 891.)



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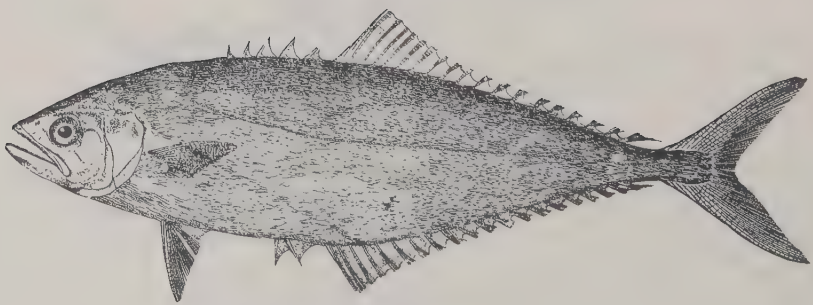


378

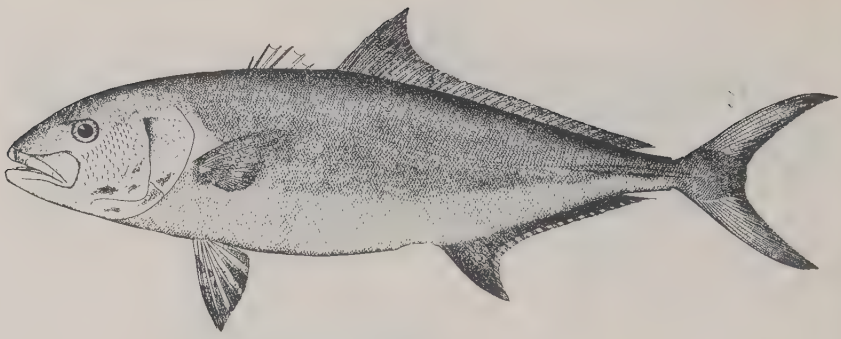
377. Nematistius pectoralis. (P. 895.)
378. Oligoplites saurus. (P. 898.)

379

380

381

379. NAUCRATES DUCTOR. (P. 900.)
380. SERIOLA DORSALIS. (P. 902.)
381. SERIOLA ZONATA. (P. 902.)



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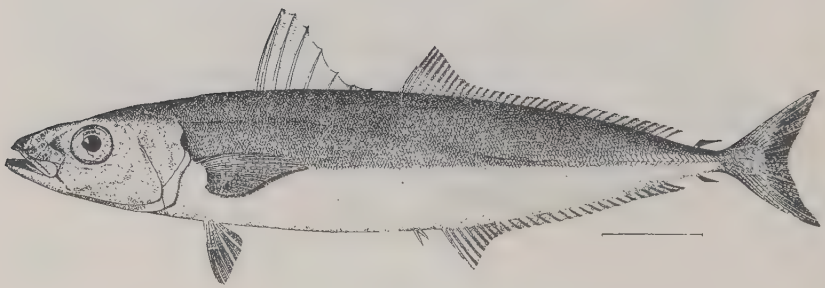

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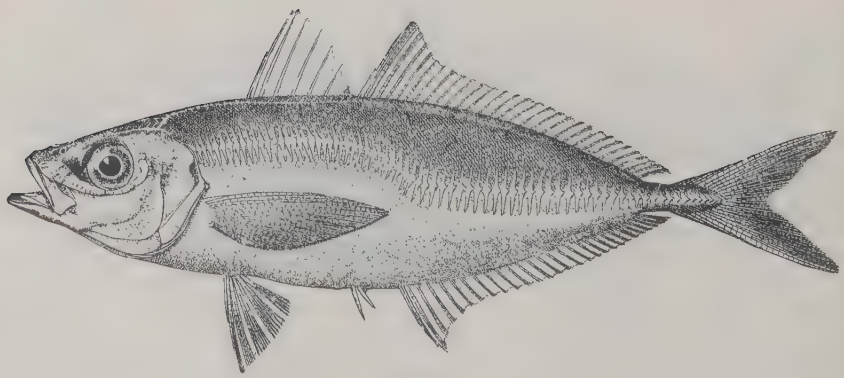
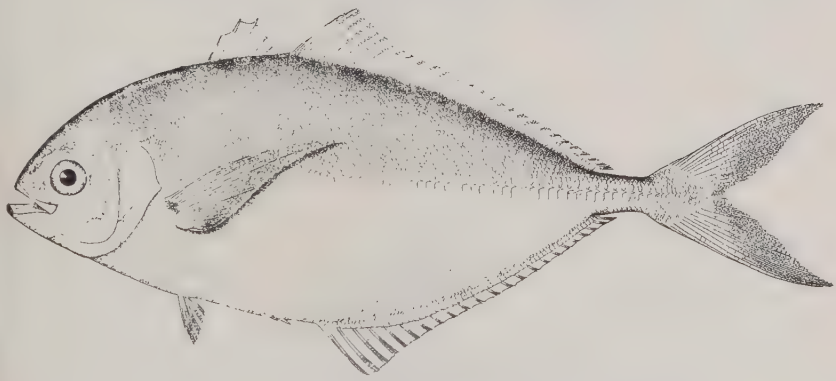


384

382. Seriola lalandi. (P. 903.)
383. Decapterus macarellus. (P. 909.)
384. Trachurus trachurus. (P. 910.)

385



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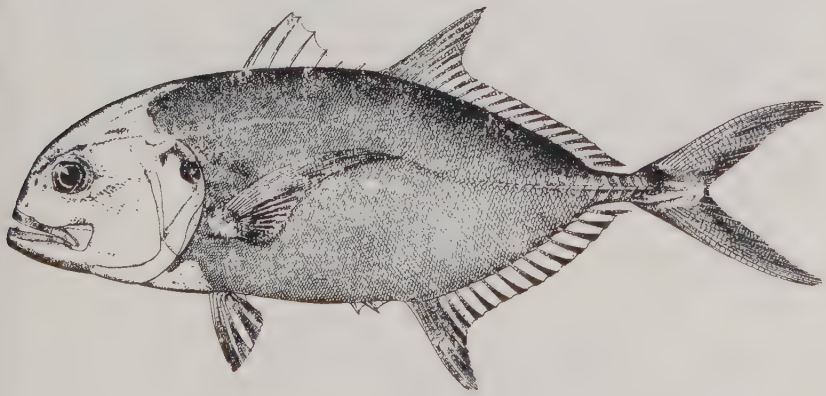
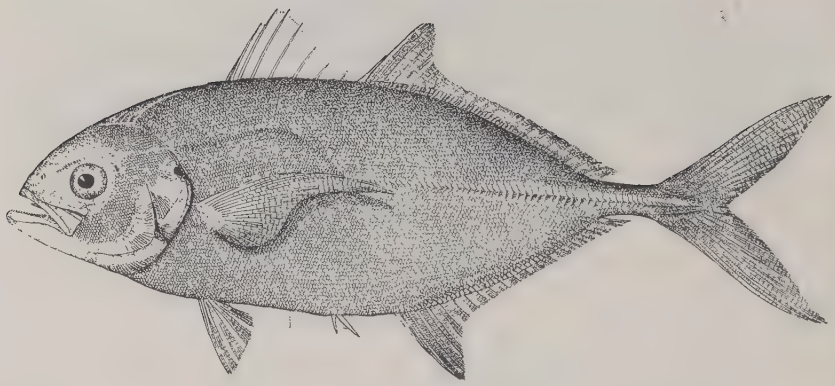


387

385. TRACHUROPS CRUMENOPHTHALMUS. (P. 911.)
386. HEMICARANX AMBLYRHYNCHUS. (P. 912.)
387. CARANX HIPPOS. (P. 920.)



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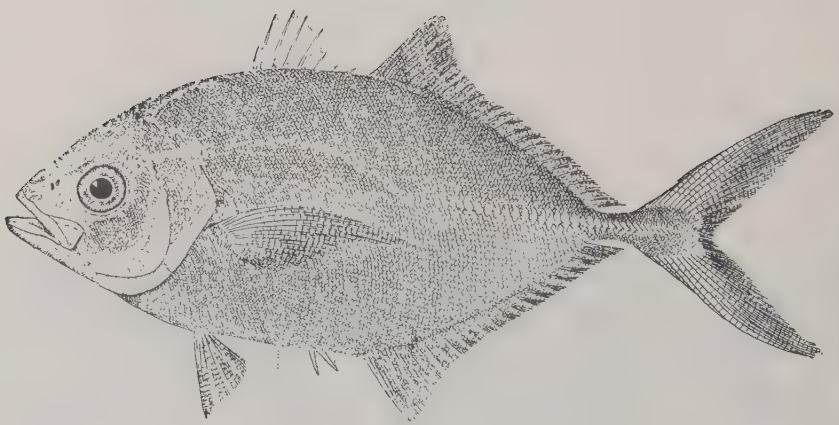
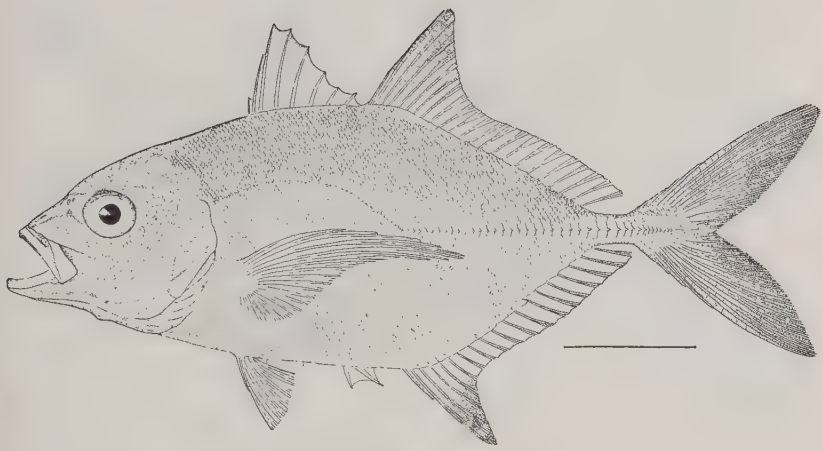


389

388. Caranx crysos. (P. 921.)
389. Caranx latus. (P. 923.)



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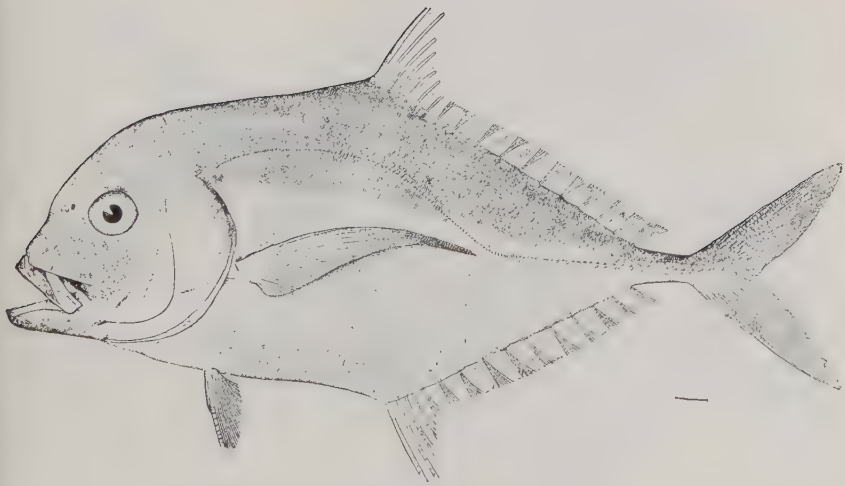
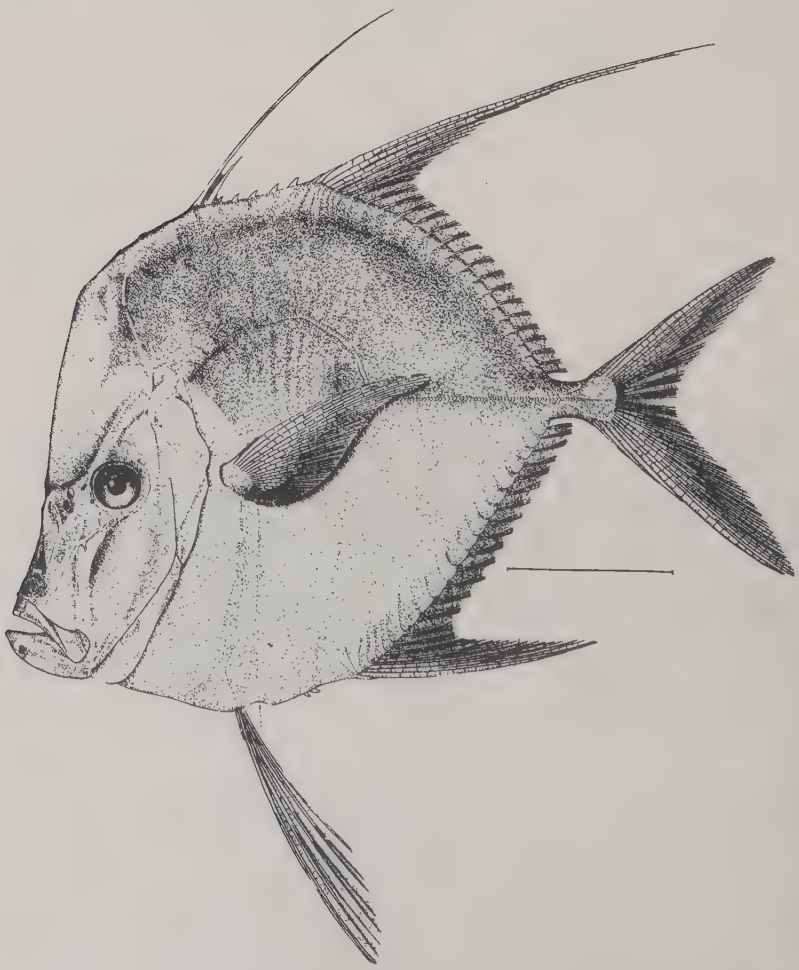


391

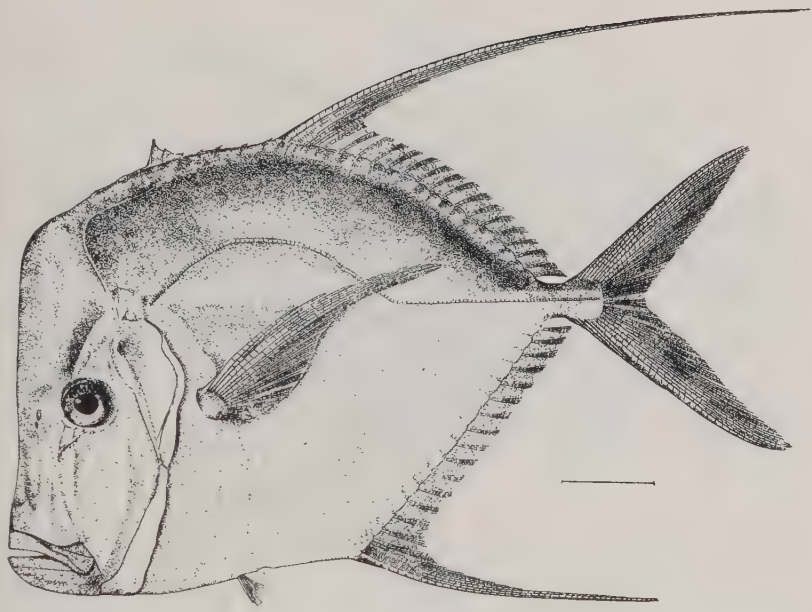
390. Caranx medusicola. (P. 924.)
391. Hynnis hopkinsi. (P. 933.)

392

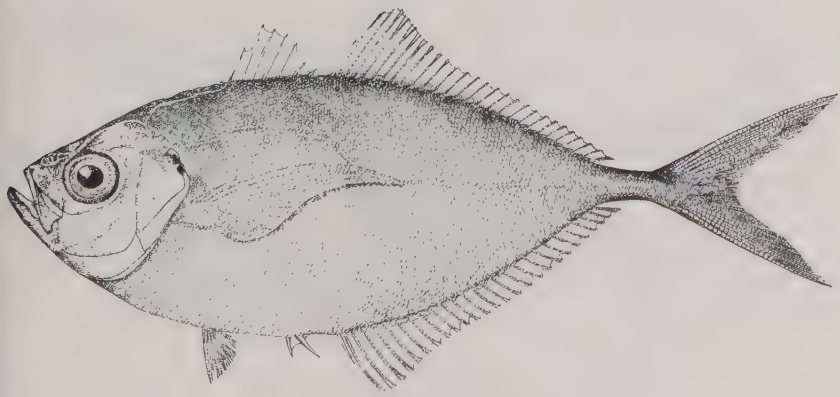


393

392. VOMER SETIPINNIS. (P. 934.)
393. SELENE VOMER; young. (P. 936.)



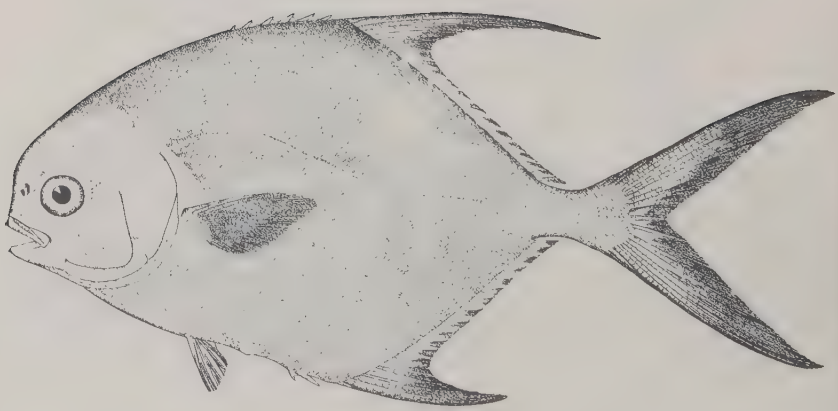
393*a*



394

393*a*. SELENE VOMER; adult. (P. 936.)
394. CHLOROSCOMBRUS CHRYSURUS. (P. 938.)

395



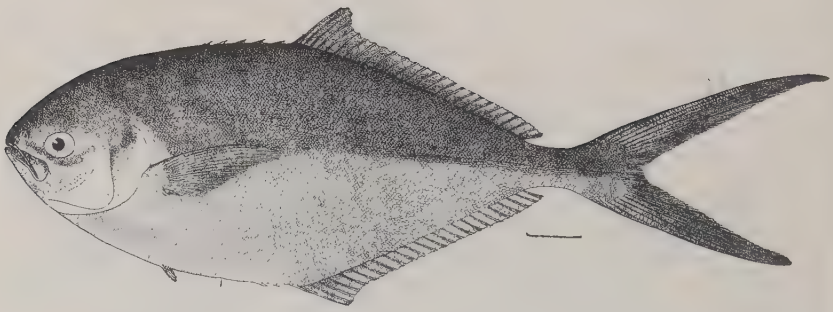
396

395. TRACHINOTUS GLAUCUS. (P. 940.)
396. TRACHINOTUS FALCATUS. (P. 941.)

397

398

397. TRACHINOTUS CULVERI. (P. 942.)
398. TRACHINOTUS CAROLINUS. (P. 944.)



399

400

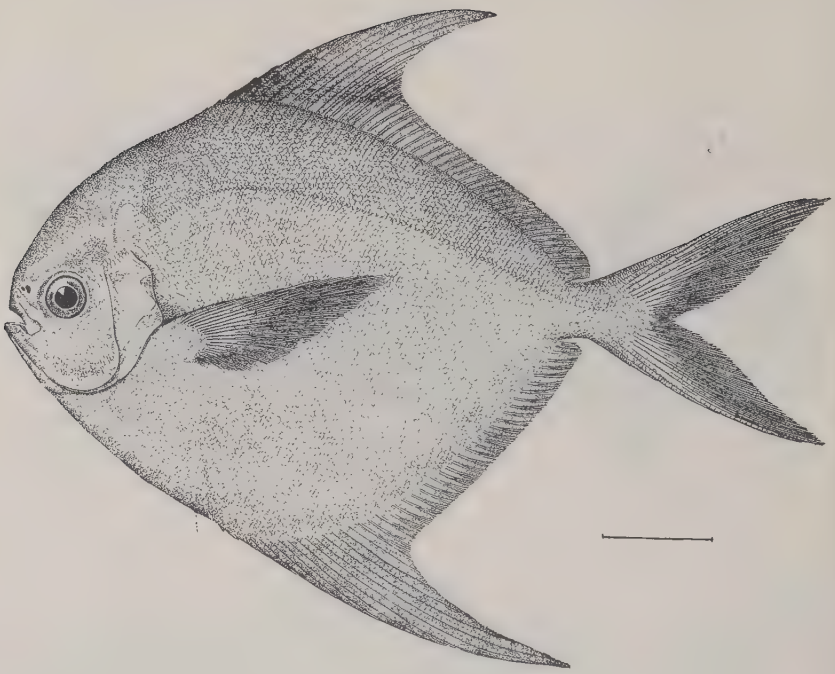
401

399. Zalocys stilbe. (P. 2848.)
400. Pomatomus saltatrix. (P. 946.)
401. Rachycentron canadus. (P. 948.)

402

403

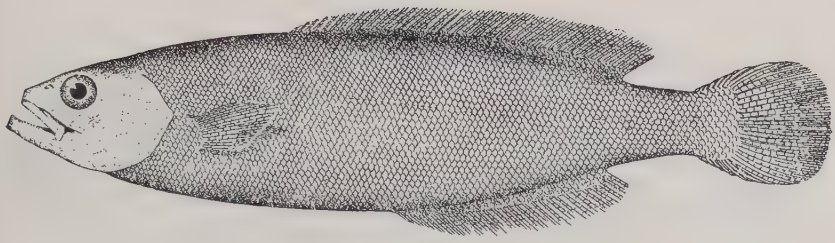
402. Coryphæna hippurus. (P. 952.)
403. Centrolophus niger. (P. 963.)



404

405

404. Rhombus paru. (P. 965.)
405. Poronotus triacanthus. (Pp. 967, 2849.)



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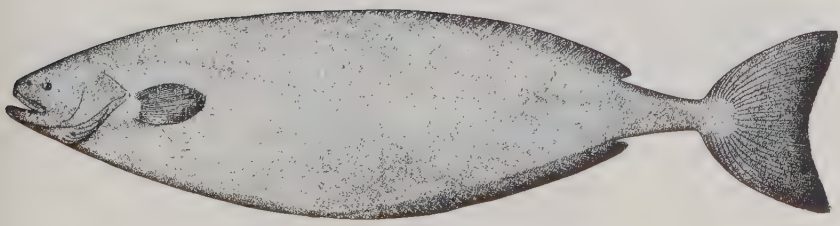
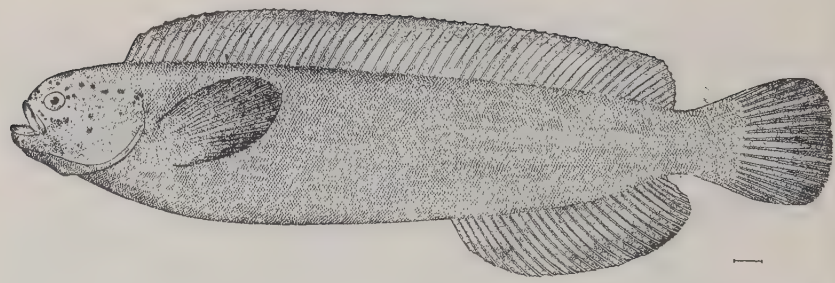


408

406. Icichthys lockingtoni. (P. 969.)
407. Schedophilus medusophagus. (P. 970.)
408. Acrotus willoughbyi. (P. 973.)



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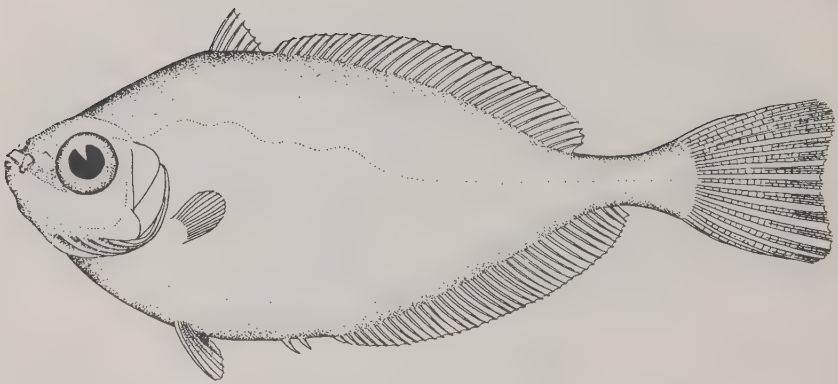

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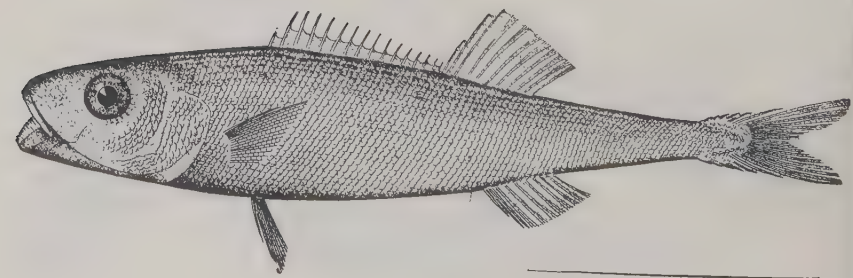
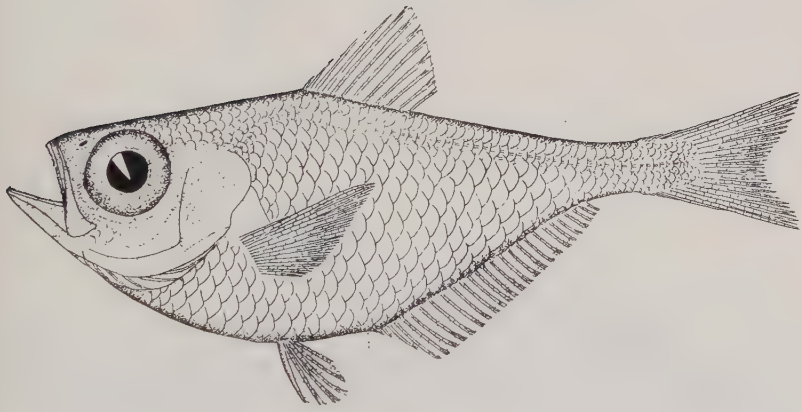


411

409. Zaprora silenus. (P. 2850.)
410. Grammicolepis brachiusculus. (P. 974.)
411. Tetragonurus cuvieri. (P. 976.)

412



413

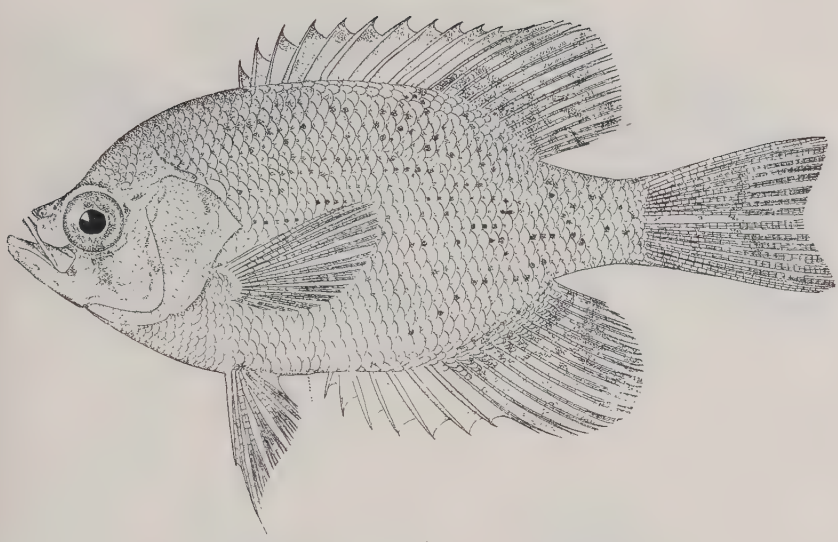
414

412. PEMPHERIS MULLERI. (P. 978.)
413. PEMPHERIS POEYI. (P. 979.)
414. ELASSOMA EVERGLADEI. (P. 982.)

415

416

415. POMOXIS ANNULARIS. (P. 987.)
416. POMOXIS SPAROIDES. (P. 987.)



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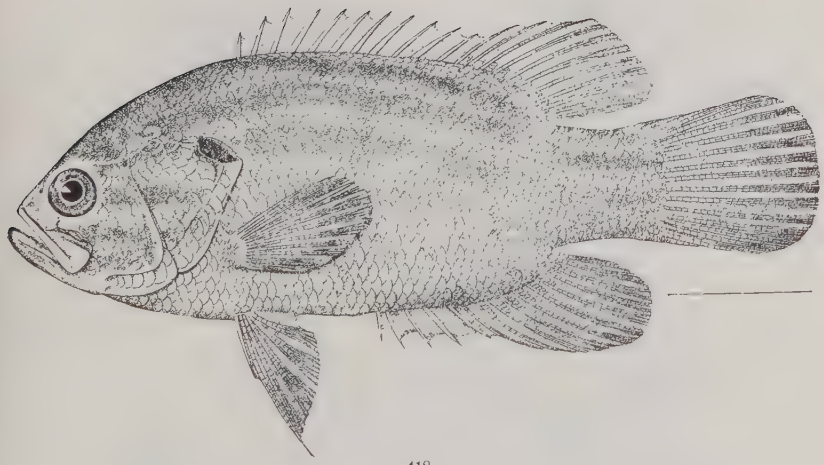
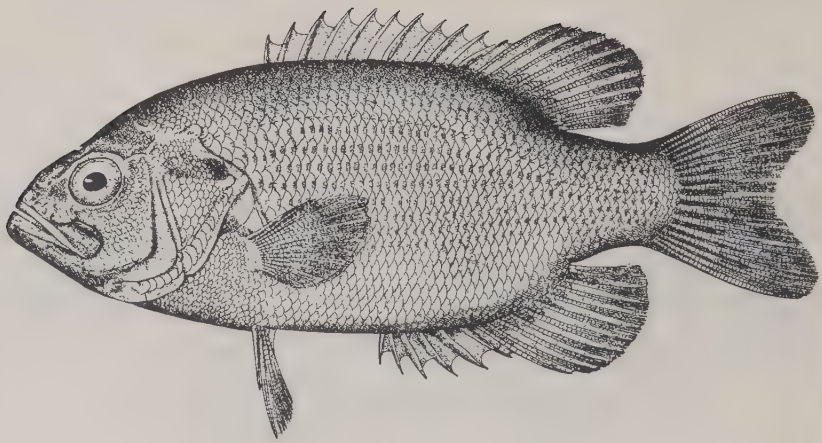
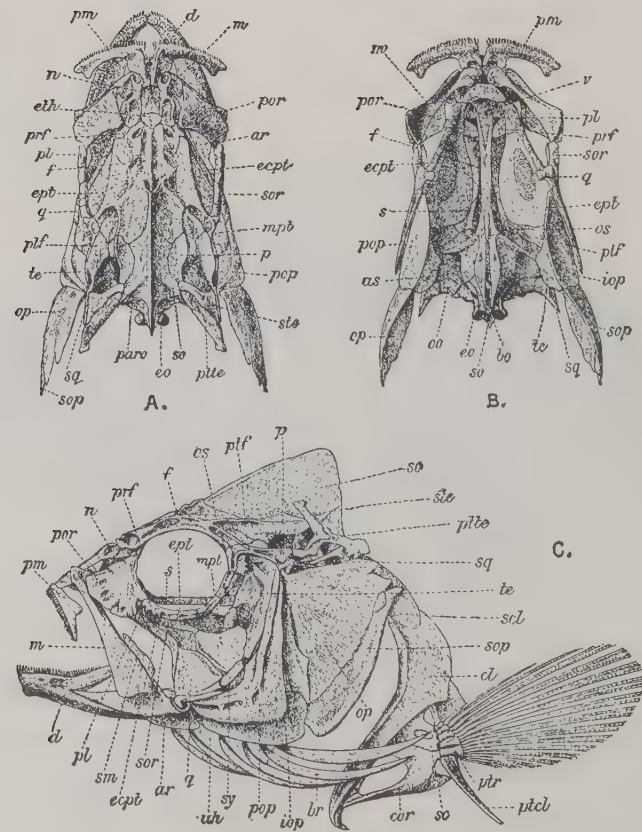


418

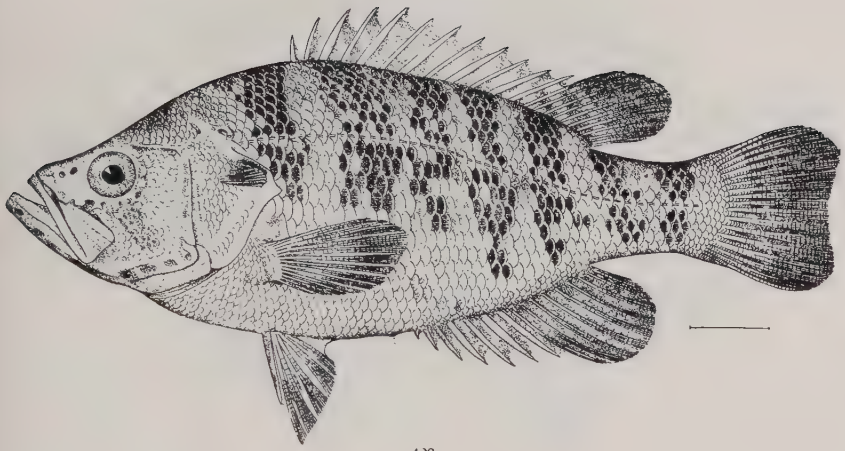
417. CENTRARCHUS MACROPTERUS. (P. 988.)
418. ACANTHARCHUS POMOTIS. (P. 989.)



419



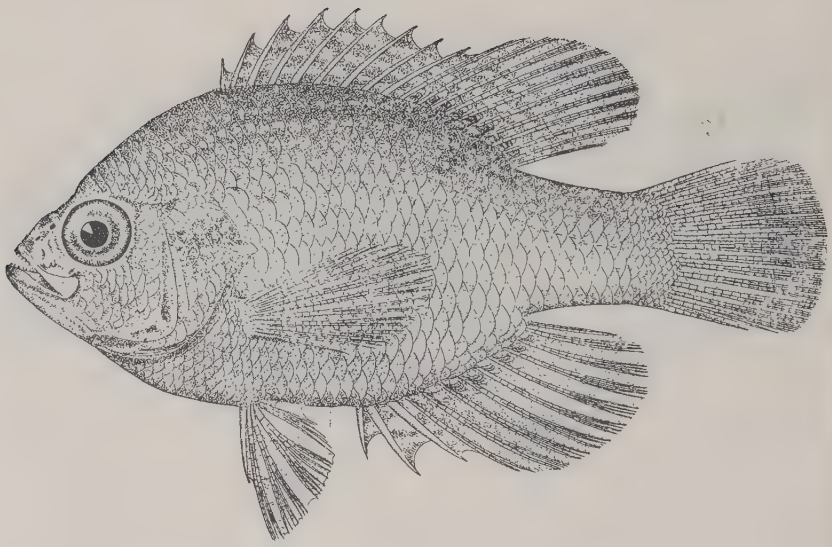
419. Ambloplites rupestris. (P. 990.)
A, *B*, *C*. Skull of Ambloplites rupestris. (P. 990.)



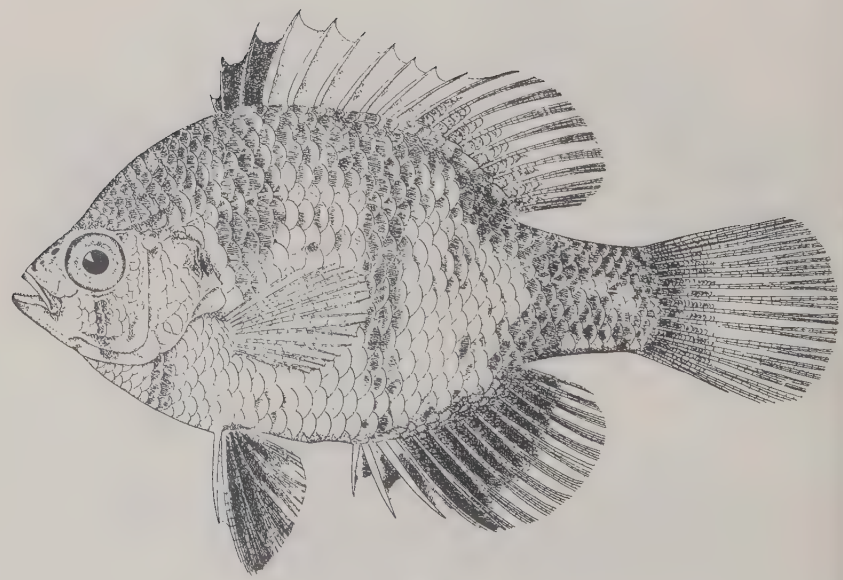
420

421

420. Archoplites interruptus. (P. 991.)
421. Chænobryttus gulosus. (P. 992.)

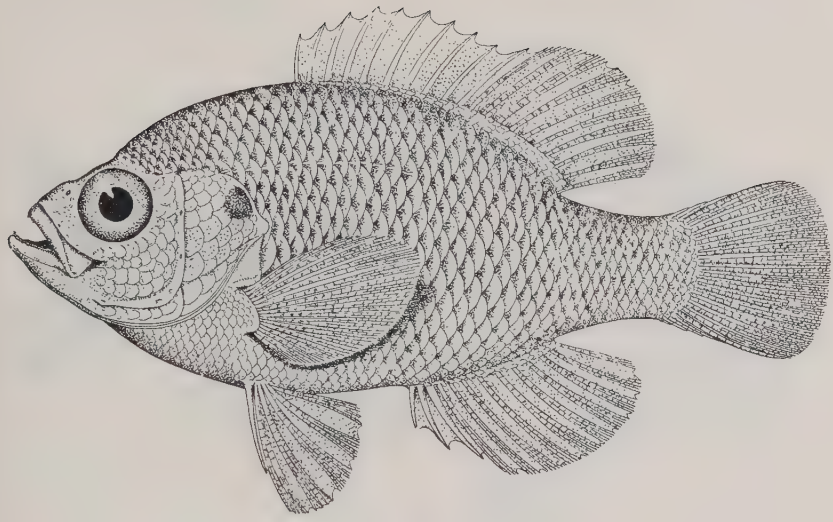


422

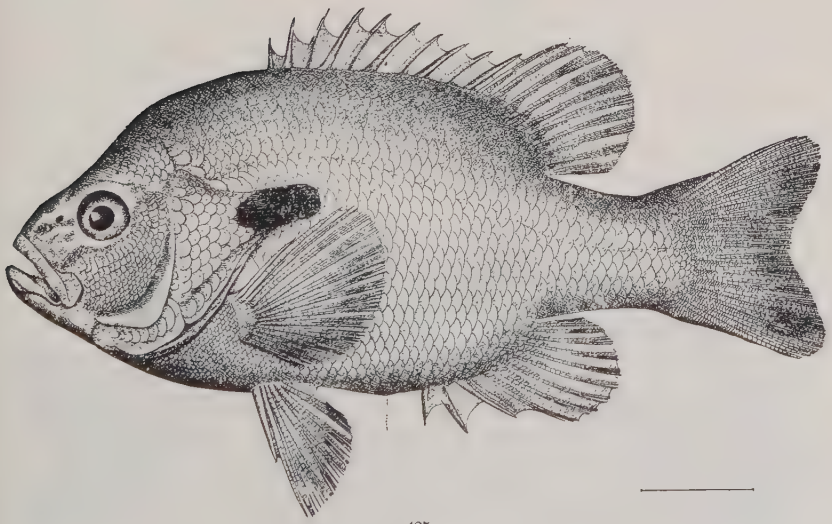


423

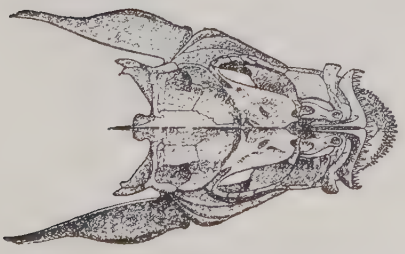
422. ENNEACANTHUS GLORIOSUS. (P. 993.)
423. MESOGONISTIUS CHÆTODON. (P. 995.)



424

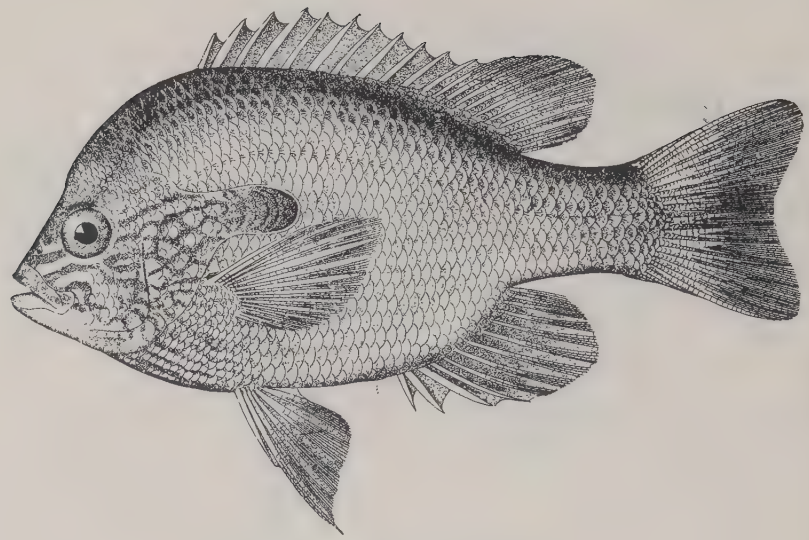


425

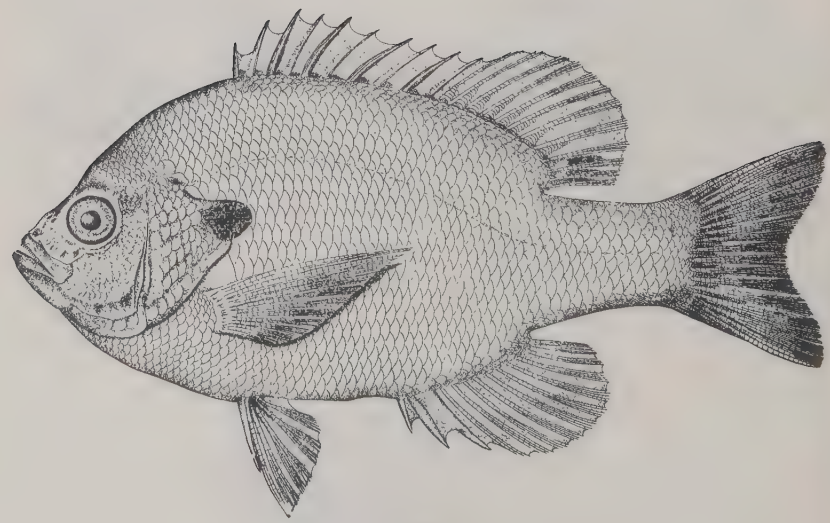


425*a*

424. Apomotis symmetricus. (P. 998.)
425. Lepomis auritus. (P. 1001.)
425*a*. Skull of Lepomis auritus. (P. 1001.)

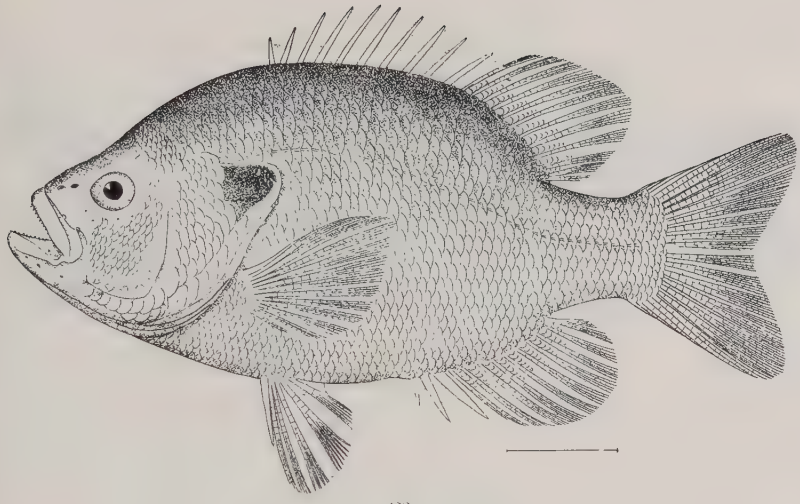


426



427

426. LEPOMIS MEGALOTIS. (P. 1002.)
427. LEPOMIS PALLIDUS. (P. 1005.)



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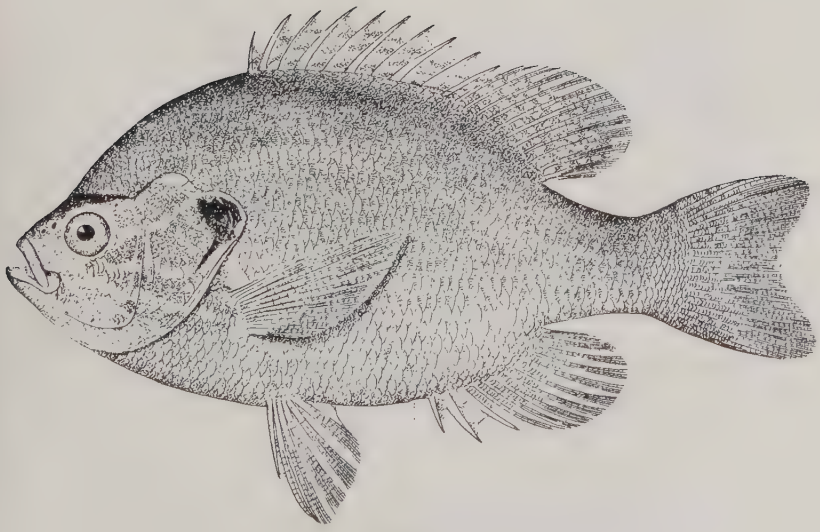
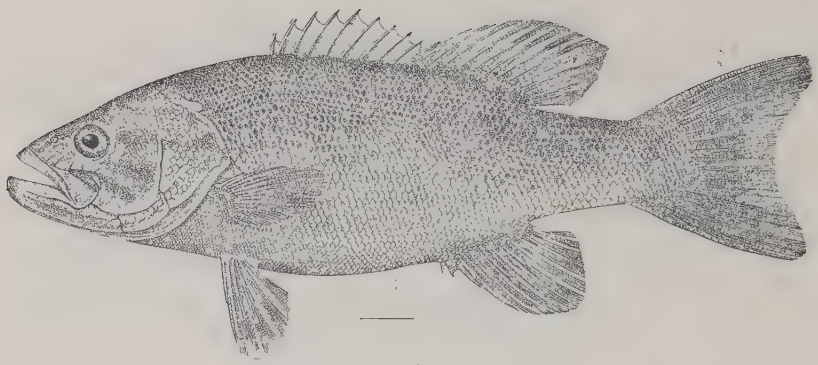
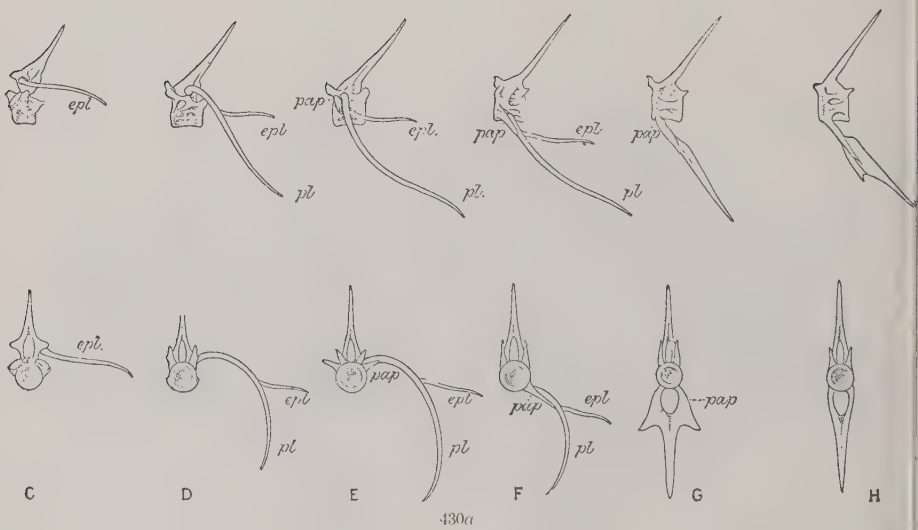


429

428. Eupomotis euryorus. (P. 1008.)
429. Eupomotis gibbosus. (P. 1009.)

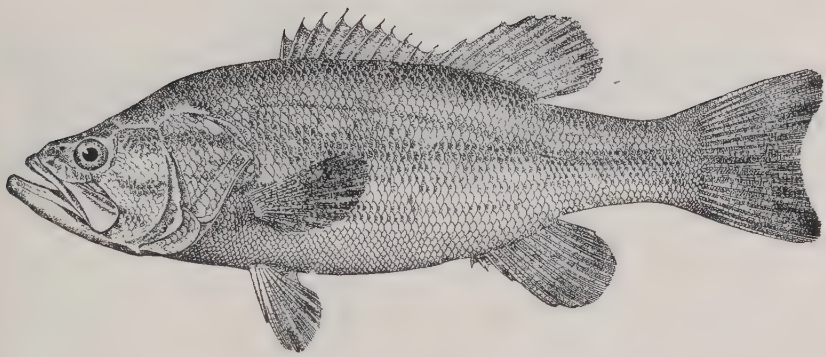


430

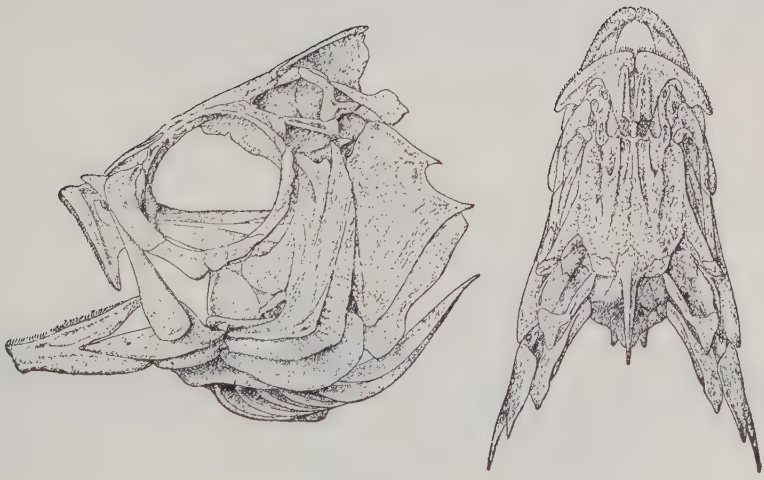


430*a*

430. MICROPTERUS DOLOMIEU. (P. 1011.)
430*a*. VERTEBRÆ OF MICROPTERUS DOLOMIEU. (P. 1011.)



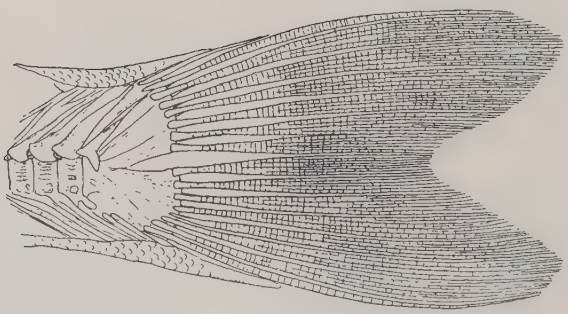
431



432

431. Micropterus salmoides. (P. 1012.)
432. Skull of Kuhlia rupestris.

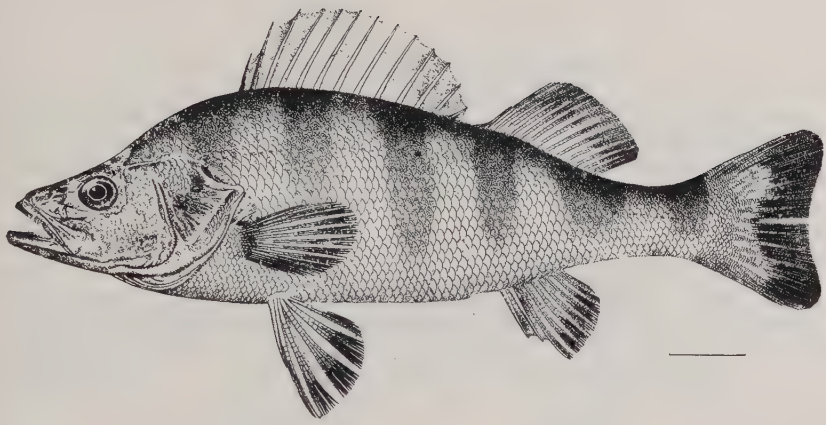
433



433*a*

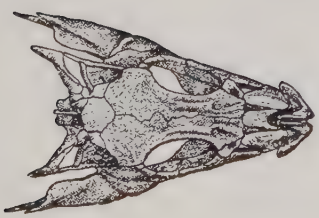
434

433. STIZOSTEDION VITREUM. (P. 1021.)
433*a*. TAIL OF STIZOSTEDION VITREUM. (P. 1021.)
434. STIZOSTEDION CANADENSE. (P. 1022.)



435

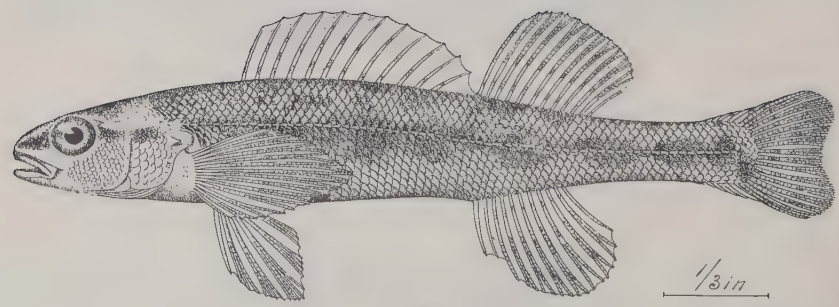
436



436*a*

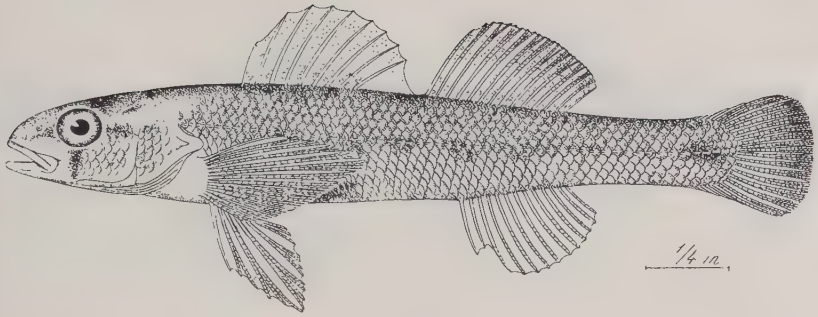
435. PERCA FLAVESCENS. (P. 1023.)
436. PERCINA CAPRODES. (P. 1026.)
436*a*. SKULL OF PERCINA CAPRODES. (P. 1026.)

437



438

437. HADROPTERUS MACROCEPHALUS. (P. 1031.)
438. HADROPTERUS ASPRO. (P. 1032.)



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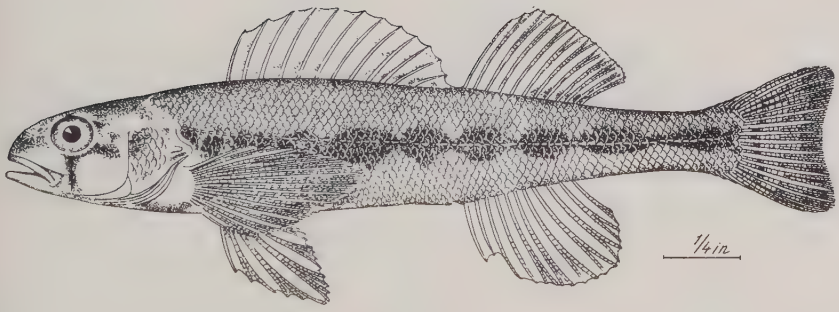

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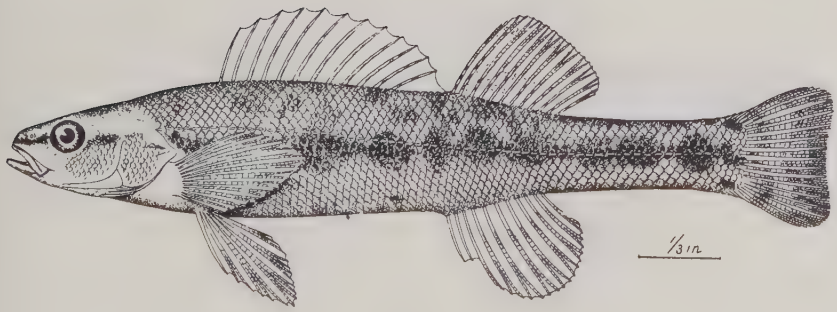
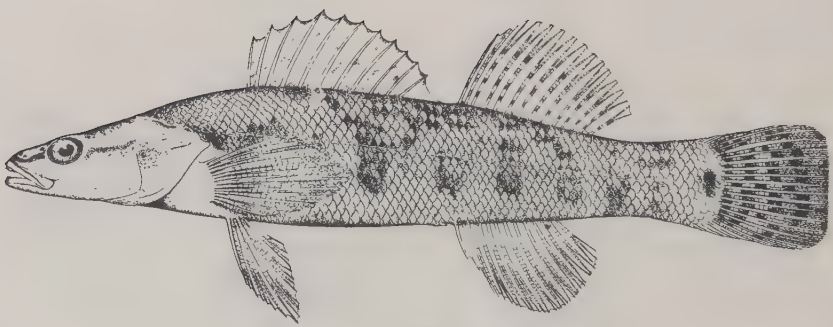


441

439. HADROPTERUS GUNTHERI. (P. 1033.)
440. HADROPTERUS EVIDES. (P. 1036.)
441. HADROPTERUS SCIERUS. (P. 1037.)

442



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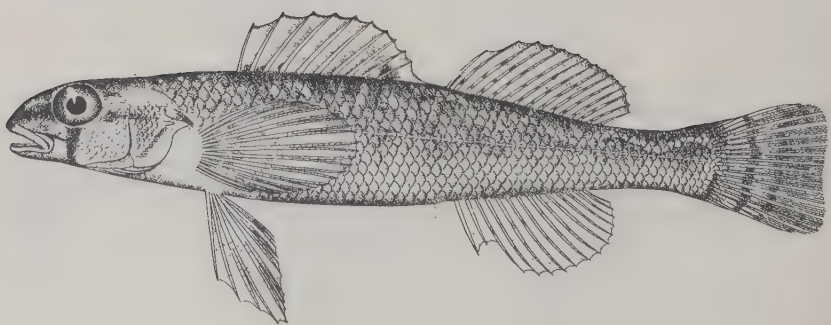


444

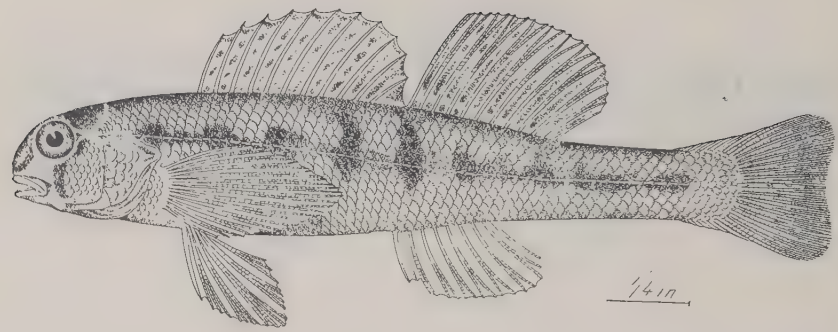
442. HYPOHOMUS AURANTIACUS. (P. 1040.)
443. HYPOHOMUS SPILOTUS. (P. 1043.)
444. COTTOGASTER SHUMARDI. (P. 1046.)

445

446

447

445. COTTOGASTER CHENEYI. (P. 2851.)
446. ULOCENTRA GILBERTI. (P. 1049.)
447. ULOCENTRA MEADIÆ. (P. 2852.)



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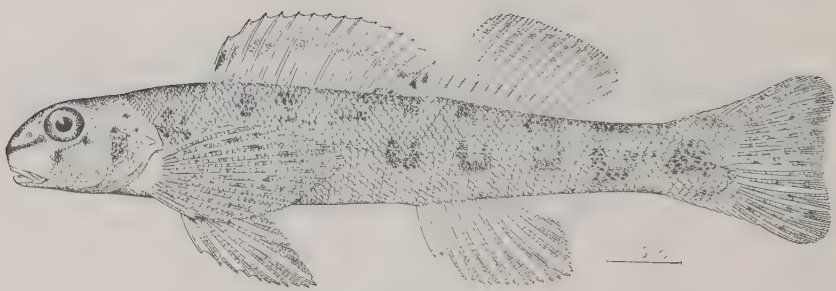
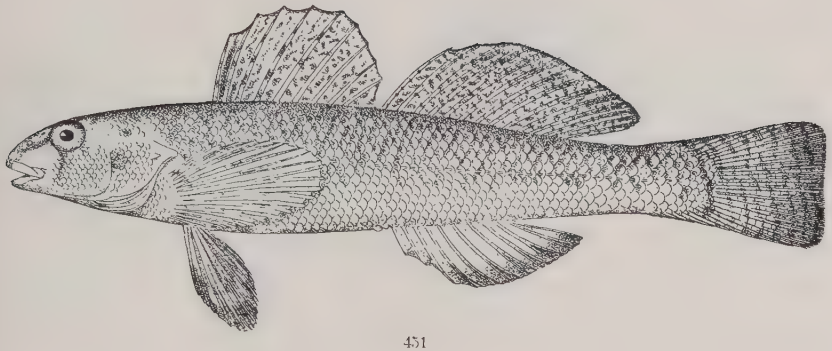


449

450

448. Ulocentra simotera. (P. 1051.)
449. Diplesion blennioides. (P. 1053.)
450. Boleosoma nigrum. (P. 1056.)



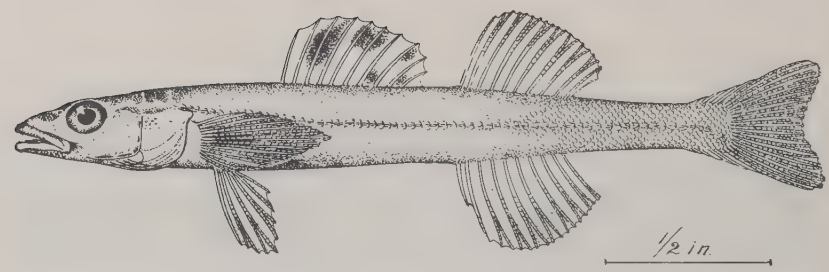
451

452

453

451. Boleosoma nigrum olmstedi. (P. 1057.)
452. Boleosoma camurum. (P. 1060.)
453. Crystallaria asprella. (P. 1061.)

454



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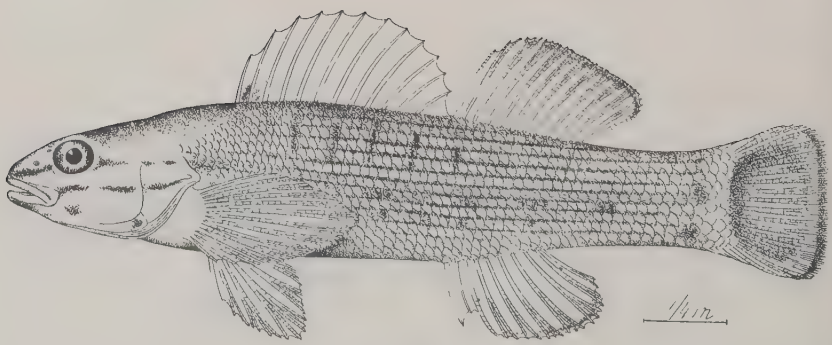
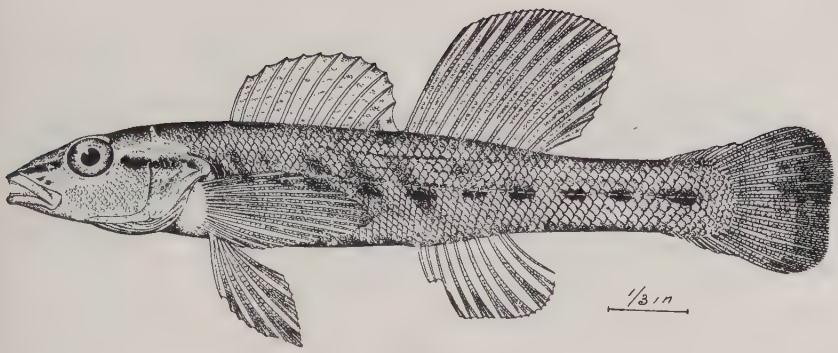
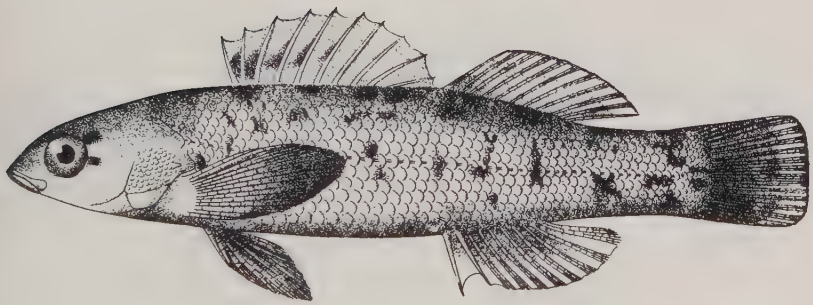


456

454. AMMOCRYPTA PELLUCIDA CLARA. (P. 1063.)
455. AMMOCRYPTA BEANII. (P. 1064.)
456. ETHEOSTOMA CAMURUM. (P. 1076.)



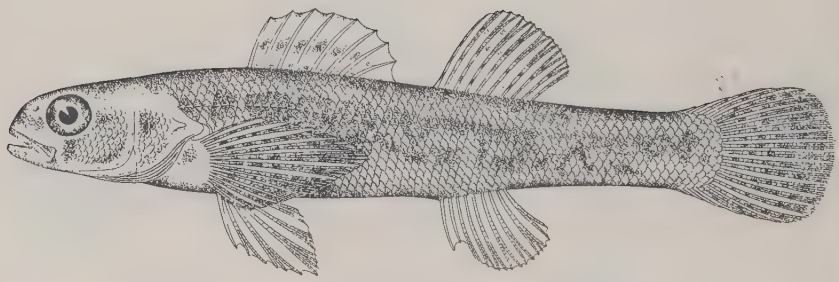
457



458

459

457. ETHEOSTOMA CINEREUM. (P. 1078.
458. ETHEOSTOMA JORDANI. (P. 1079.)
459. ETHEOSTOMA POTTSII. (P. 1082.)



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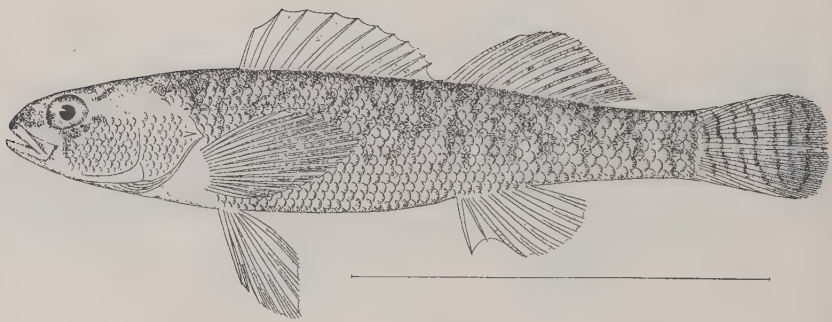

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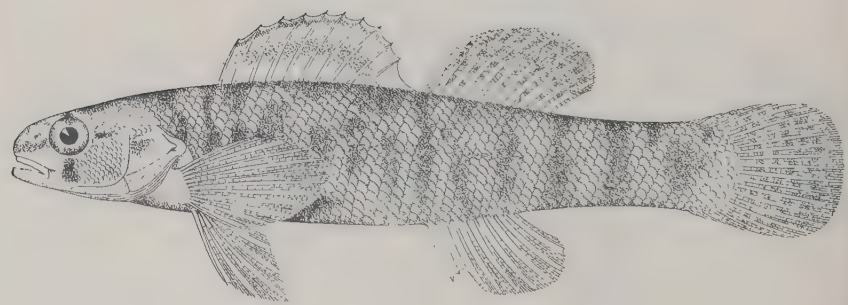
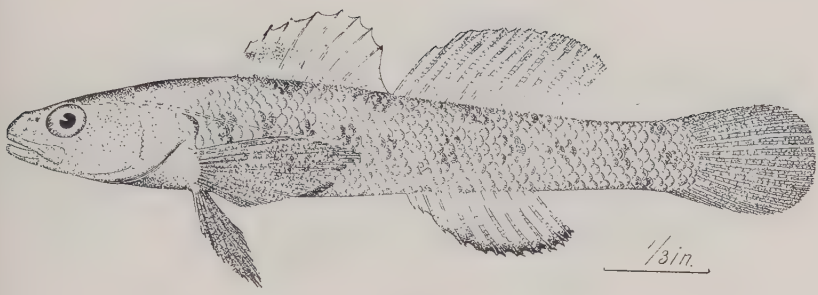


462

460. ETHEOSTOMA IOWÆ. (P. 1083.)
461. ETHEOSTOMA JESSIÆ. (P. 1084.)
462. ETHEOSTOMA LEPIDOGENYS. (P. 1087.)



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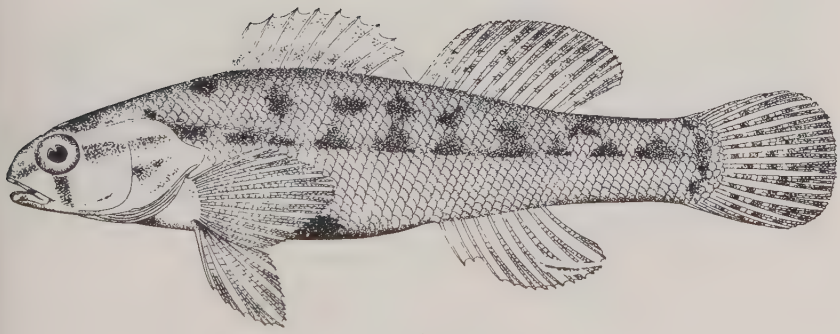
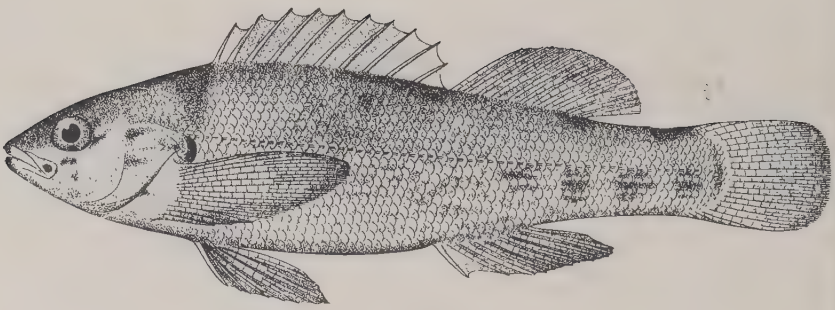


464

465

463. ETHEOSTOMA OBEYENSE. (P. 1092.)
464. ETHEOSTOMA PAGEI. (P. 1092.)
465. ETHEOSTOMA VIRGATUM. (P. 1093.)



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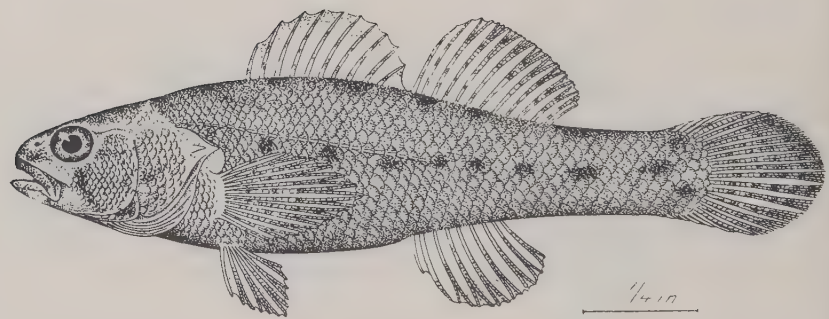
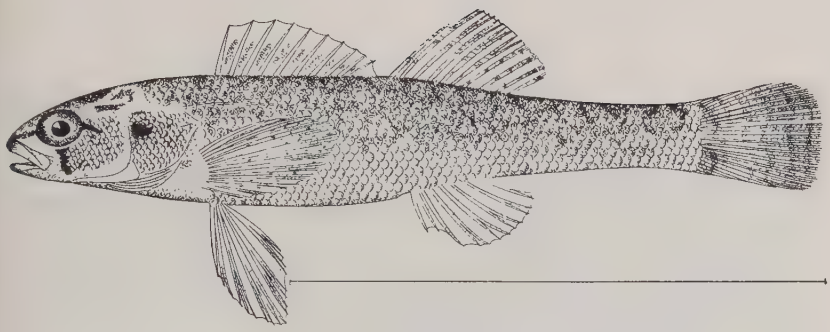


467

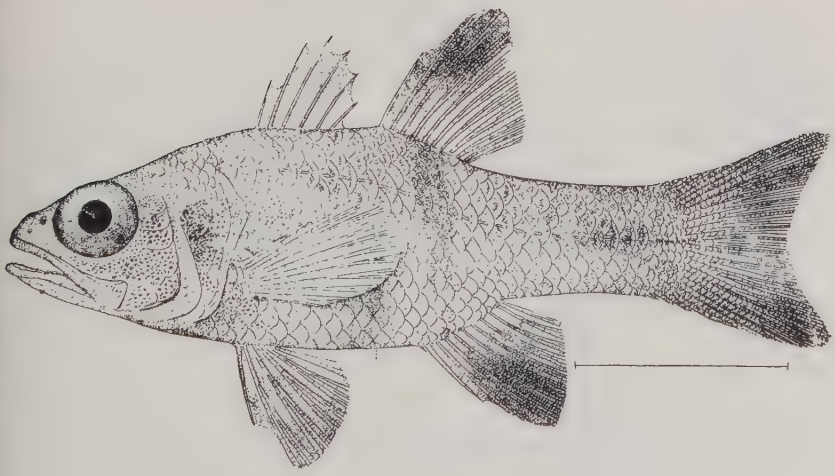
468

466. Etheostoma juliæ. (P. 1093.)
467. Psychromaster tuscumbia. (P. 1100.)
468. Copelandellus quiescens. (P. 1100.)



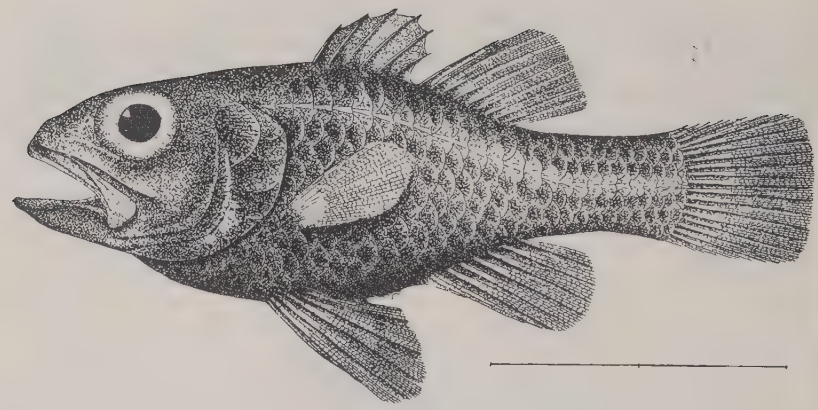
469

470



471

469. Boleichthys fusiformis. (P. 1101.)
470. Microperca fonticola. (P. 1104.)
471. Apogon retrosella. (P. 1108.)



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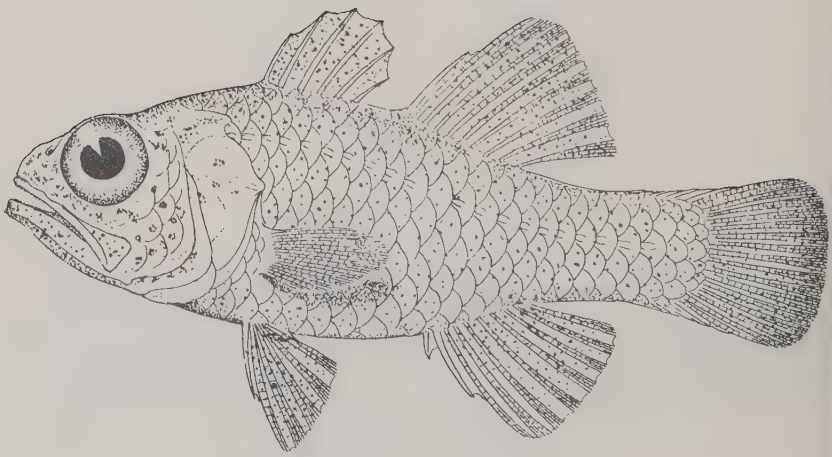
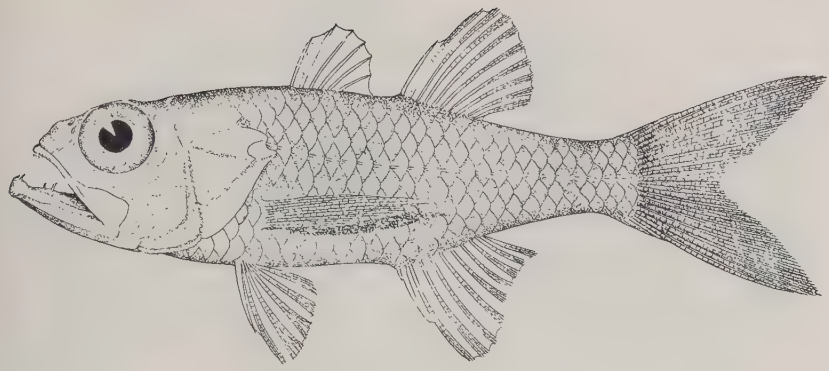


473

472. APOGON PIGMENTARIUS. (P. 1109.)
473. APOGONICHTHYS ALUTUS. (P. 1110.)



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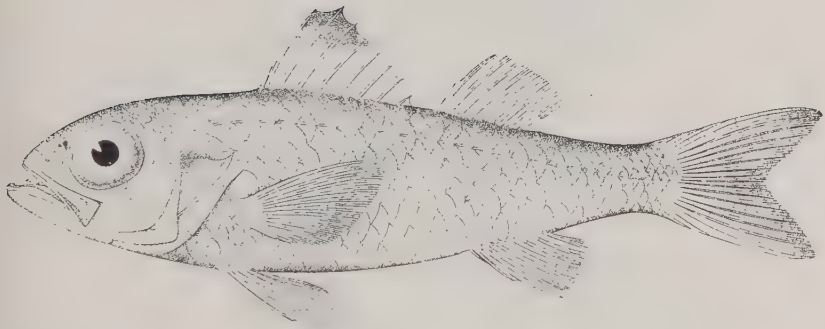
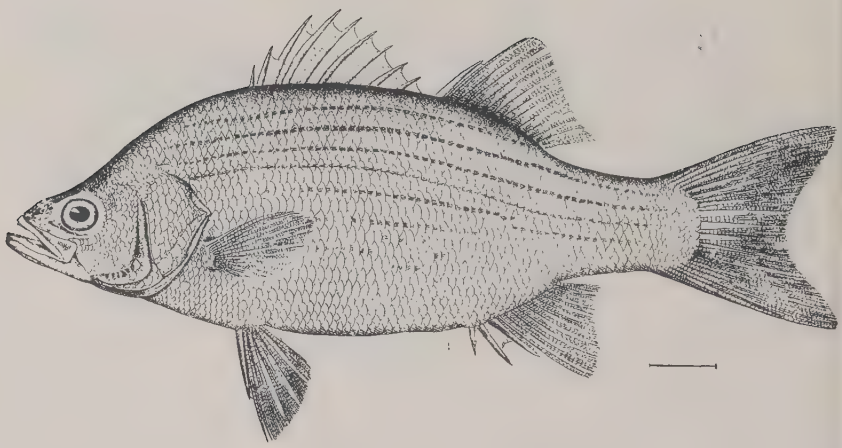


475

476

474. Cheilodipterus affinis. (P. 1113.)
475. Hypoclydonia bella. (P. 1115.)
476. Centropomus undecimalis. (P. 1118.)



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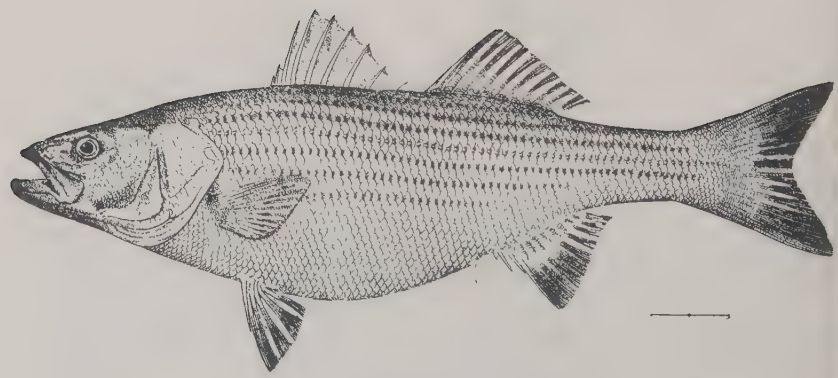
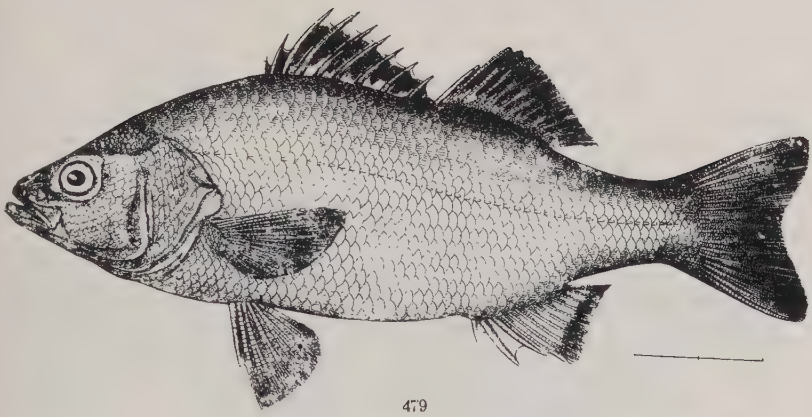


478

477. Roccus chrysops. (P. 1132.)
478. Roccus lineatus. (P. 1132.)

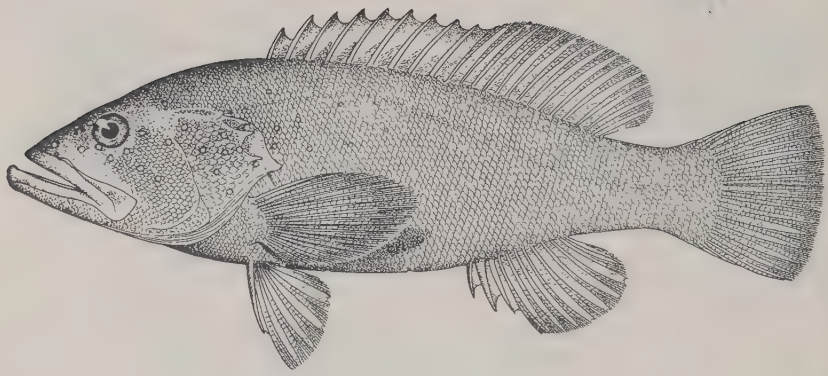


479

480

480*a*

479. MORONE AMERICANA. (P. 1134.)
480, 480*a*. SKULL OF POLYPRION AMERICANUS. (P. 1139.)



481

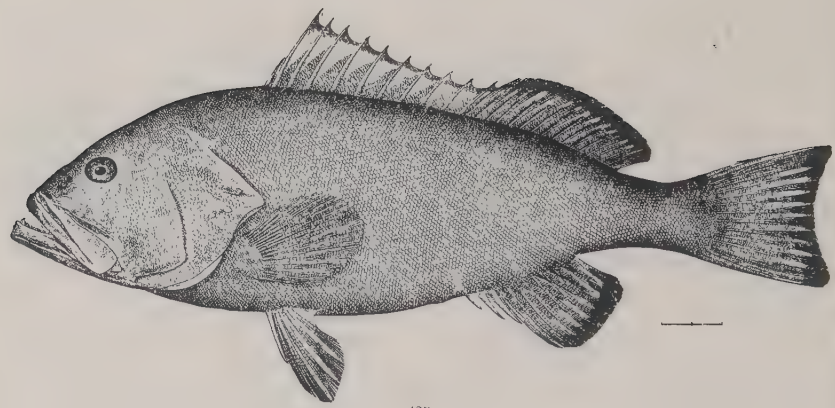
482

481. Bodianus fulvus punctatus. (P. 1146.)
482. Epinephelus adscensionis. (P. 1152.)

483

484

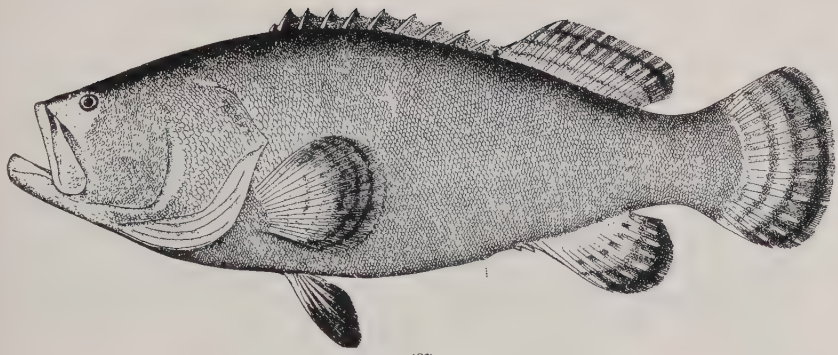
483. EPINEPHELUS STRIATUS. (P. 1157.)
484. EPINEPHELUS DRUMMOND-HAYI. (P. 1159.)



485

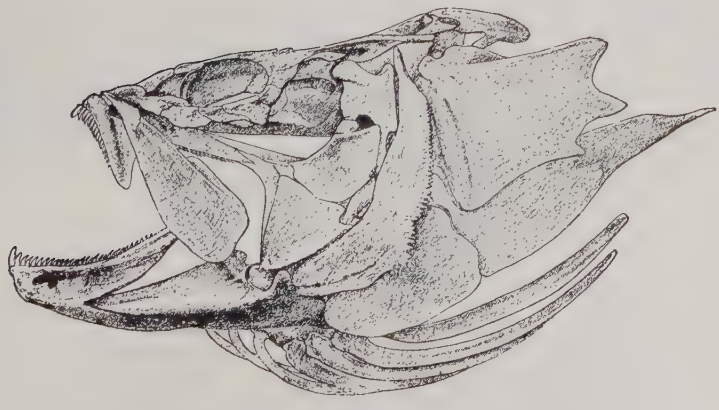
486

485. Epinephelus morio. (P. 1160.)
486. Garrupa nigrita. (P. 1161.)



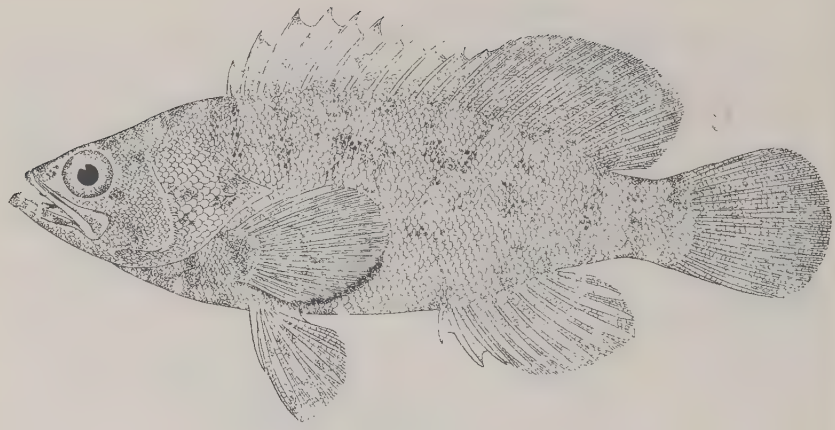
487

487*a*



487*b*

487, 487*a*, 487*b*. PROMICROPS GUTTATUS. (P. 1162.)



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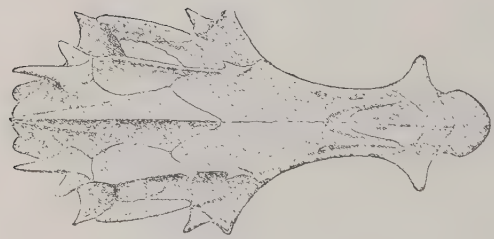
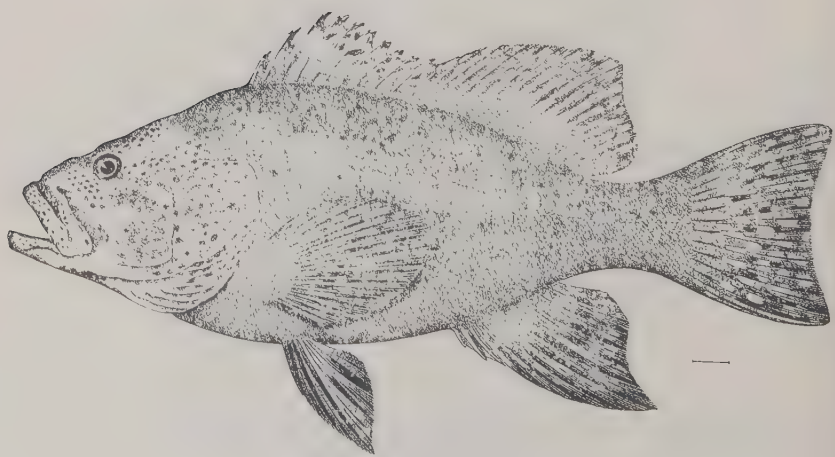


488*a*



489

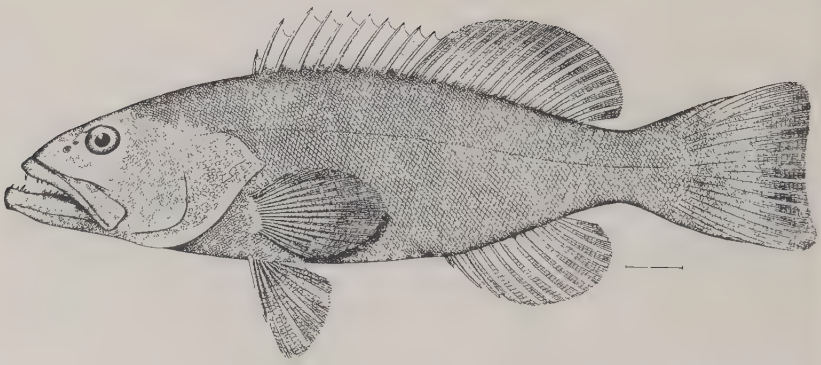
488. ALPHESTES AFER. (P. 1164.)
488*a*. SKULL OF ALPHESTES AFER. (P. 1164.)
489. DERMATOLEPIS ZANCLUS. (P. 2854.)

490

491

492

490. MYCTEROPERCA BOULENGERI. (P. 1171.)
491. MYCTEROPERCA VENENOSA. (P. 1172.)
492. SKULL OF MYCTEROPERCA BONACI. (P. 1174.)

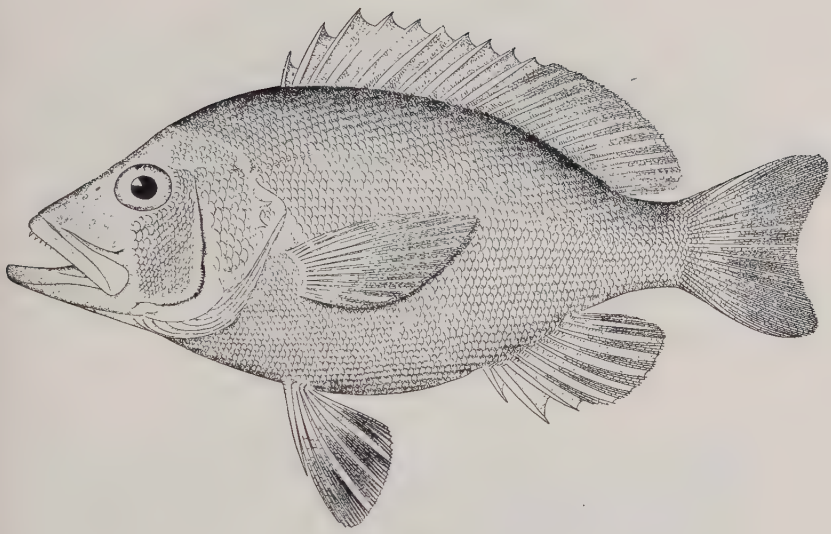


493

494

495

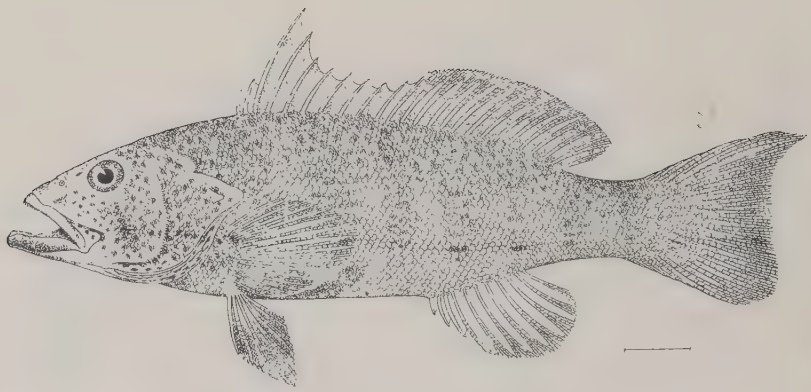
493. MYCTEROPERCA JORDANI. (P. 1176.)
494. MYCTEROPERCA MICROLEPIS. (P. 1177.)
495. MYCTEROPERCA FALCATA PHENAX. (P. 1185.)



496

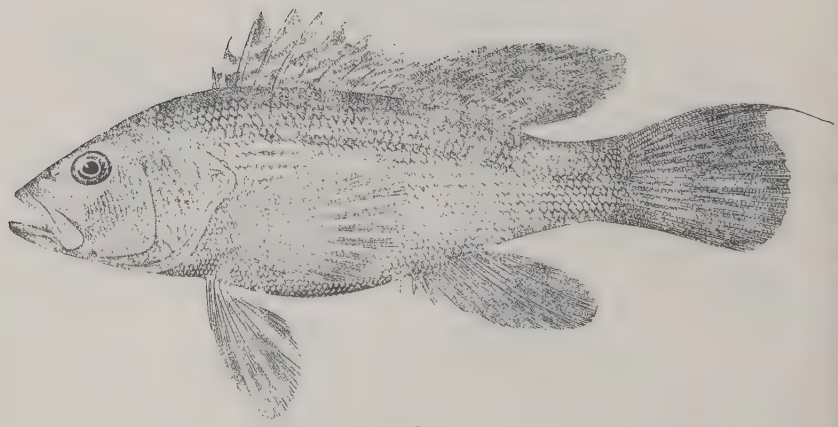
497

496. HYPOPLECTRUS UNICOLOR NIGRICANS. (P. 1193.)
497. HYPOPLECTRUS GEMMA. (P. 1193.)



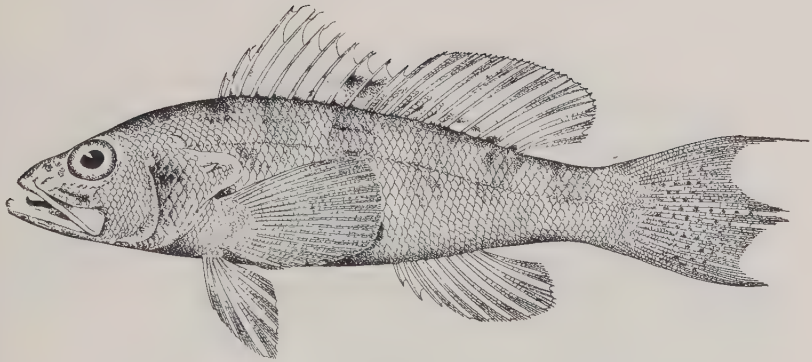
498

499



500

498. PARALABRAX MACULATOFASCIATUS. (P. 1196.)
499. PARALABRAX HUMERALIS. (P. 1196.)
500. CENTROPRISTES STRIATUS. (P. 1199.)



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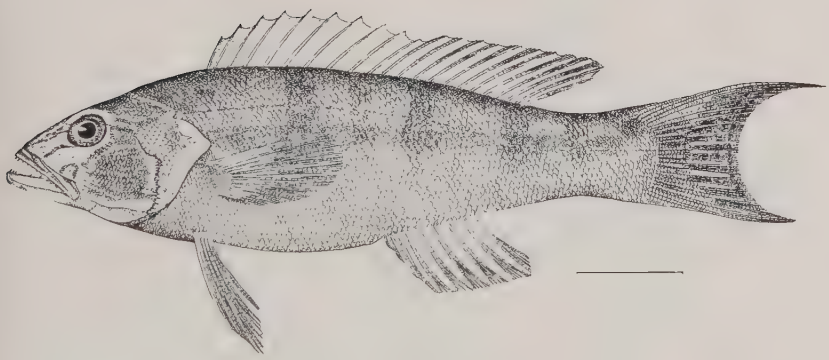

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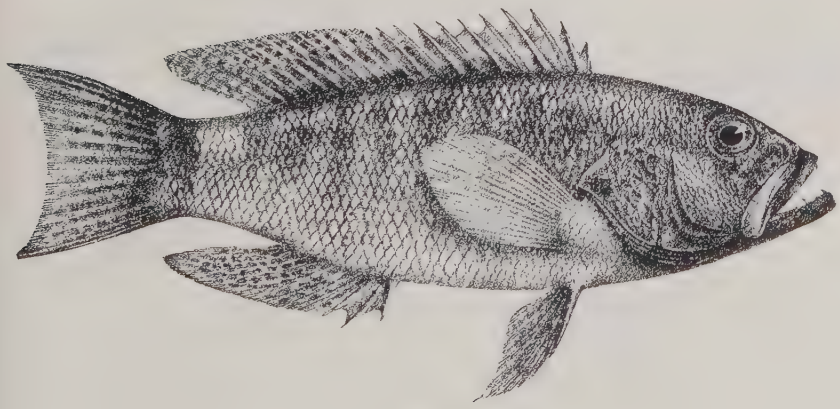
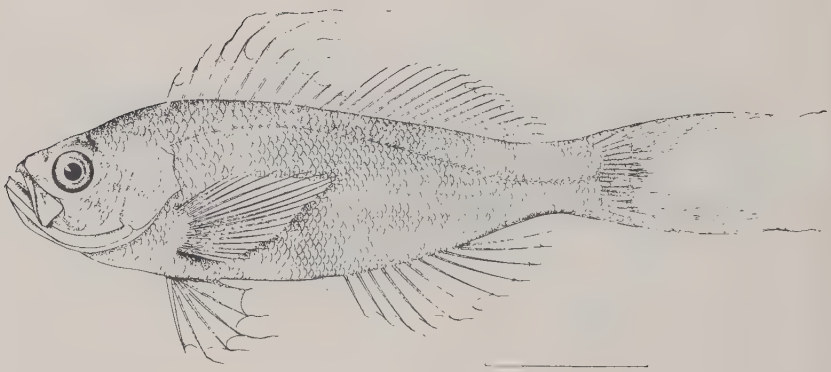


503

501. Centropristes philadelphicus. (P. 1201.)
502. Diplectrum formosum. (P. 1207.)
503. Prionodes bulleri. (P. 1213.)

504



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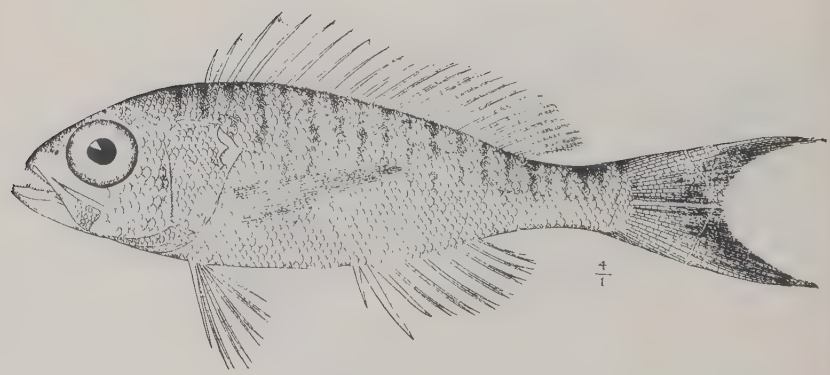
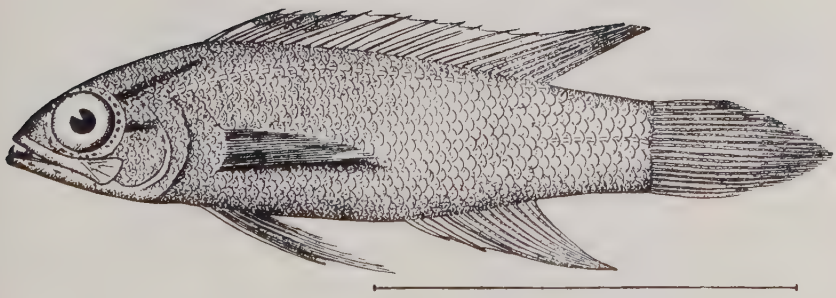


506

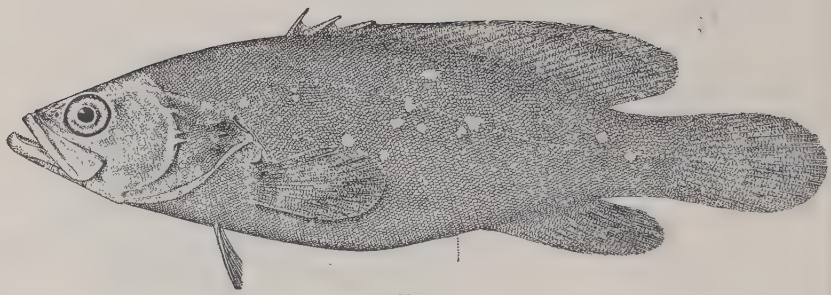
504. PARANTHIAS FURCIFER. (P. 1221.)
505. HEMIANTHIAS VIVANUS (P. 1223.)
506. PRONOTOGRAMMUS MULTIFASCIATUS. (P. 1226.)

507



508

507. ANTHIAS ASPERILINGUIS. (P. 1227.)
508. GRAMMA LORETO. (P. 1229.)



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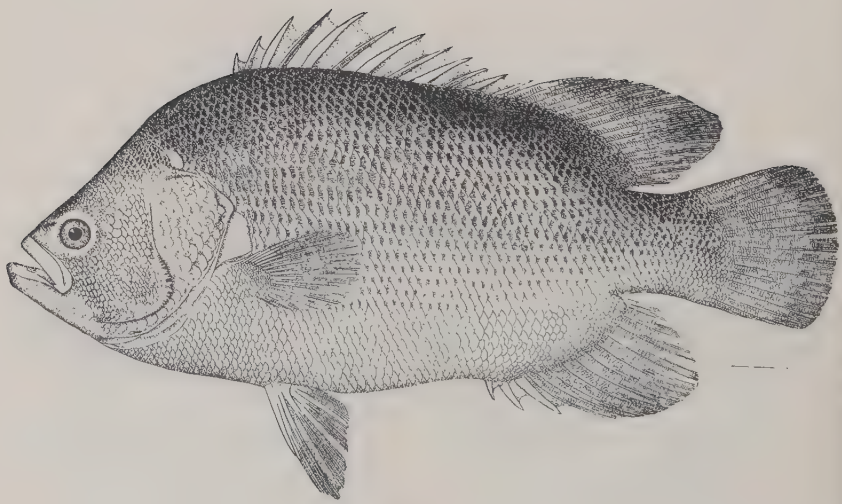
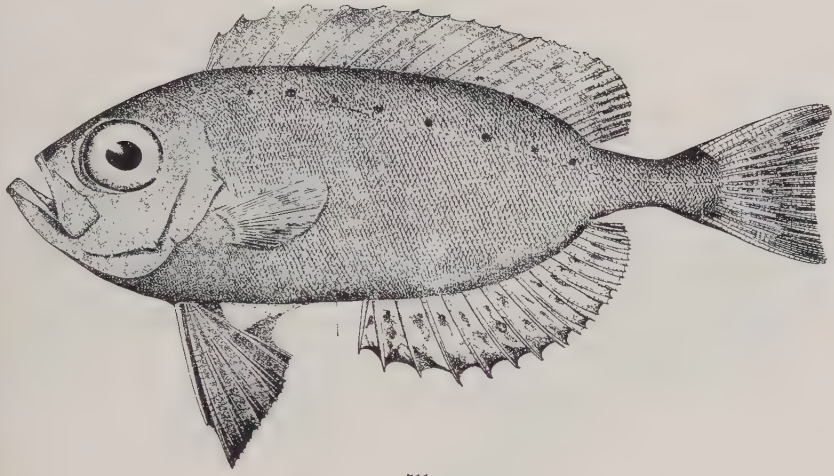


510

509. Rypticus bistrispinus. (P. 1233.)
510. Lobotes surinamensis. (P. 1235.)



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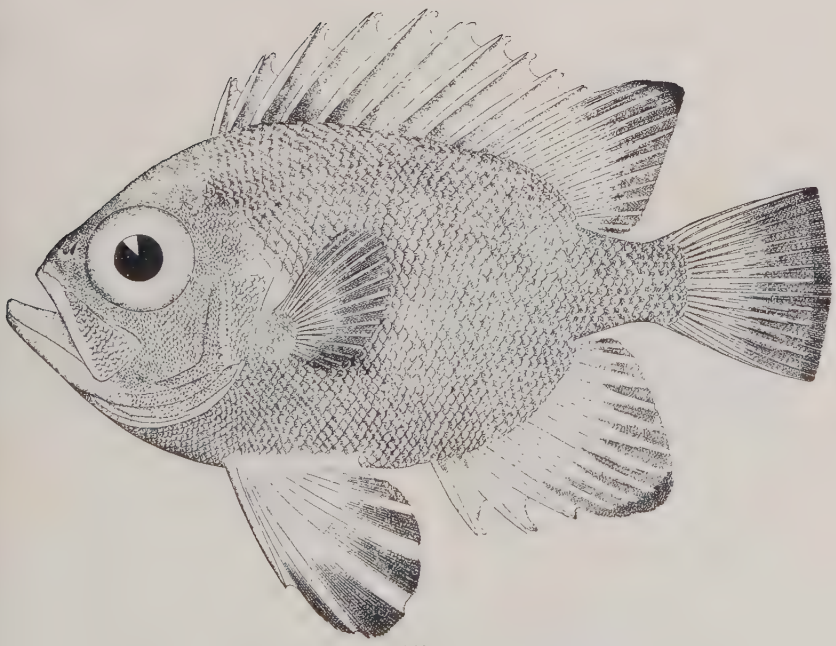
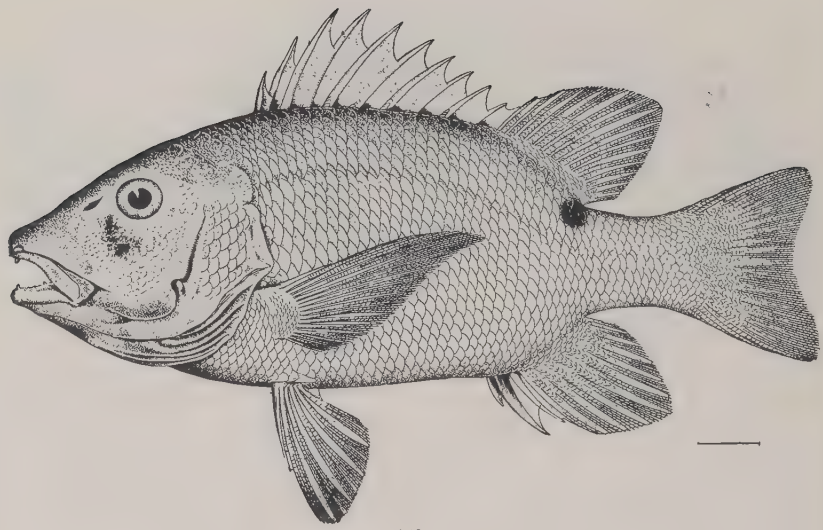


512

511. PRIACANTHUS ARENATUS. (P. 1237.)
512. PSEUDOPRIACANTHUS ALTUS. (P. 1239.)



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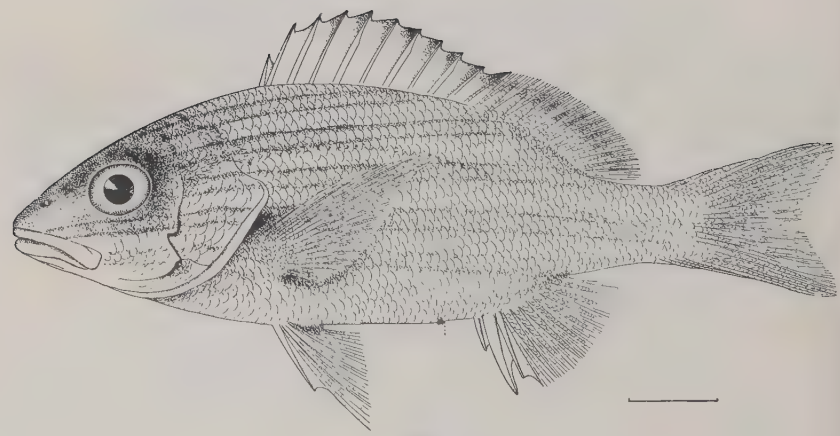
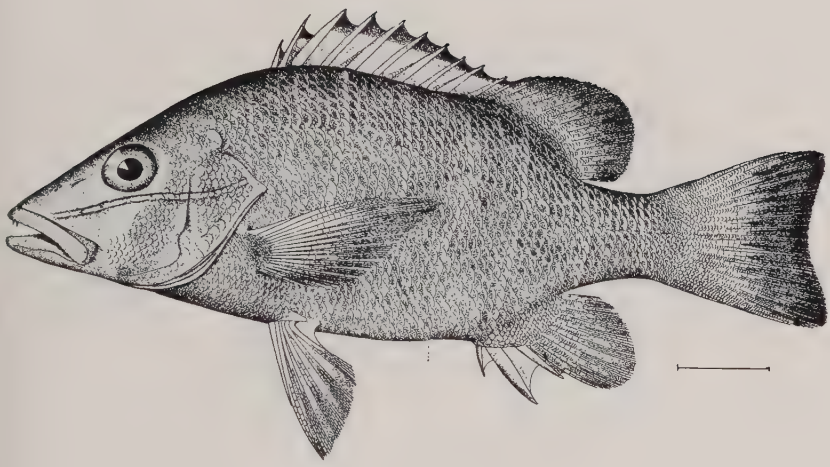


514

513. HOPLOPAGRUS GUNTHERI. (P. 1244.)
514. EVOPLITES VIRIDIS. (P. 1246.)



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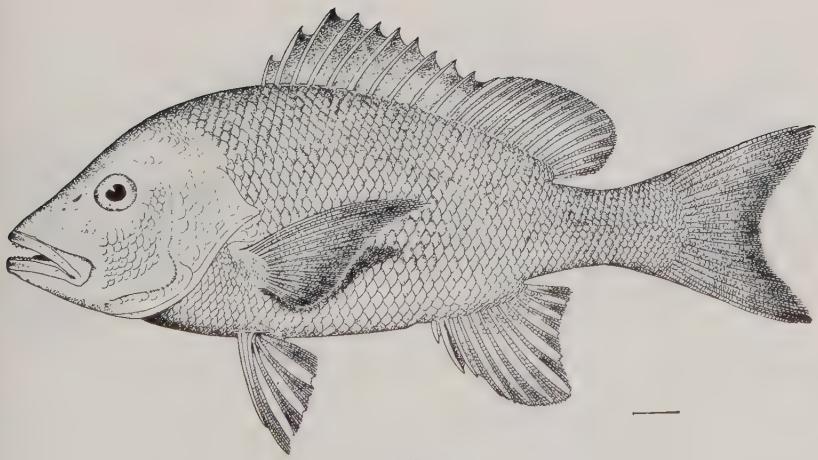
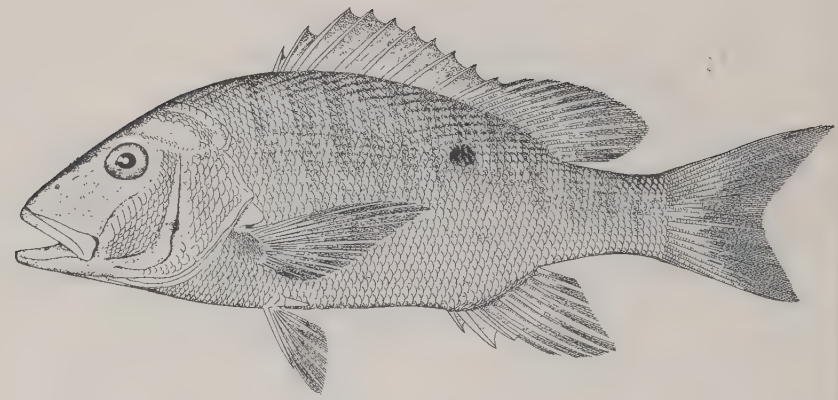


516

515. NEOMÆNIS APODUS. (P. 1258.)
516. NEOMÆNIS AYA. (P. 1264.)



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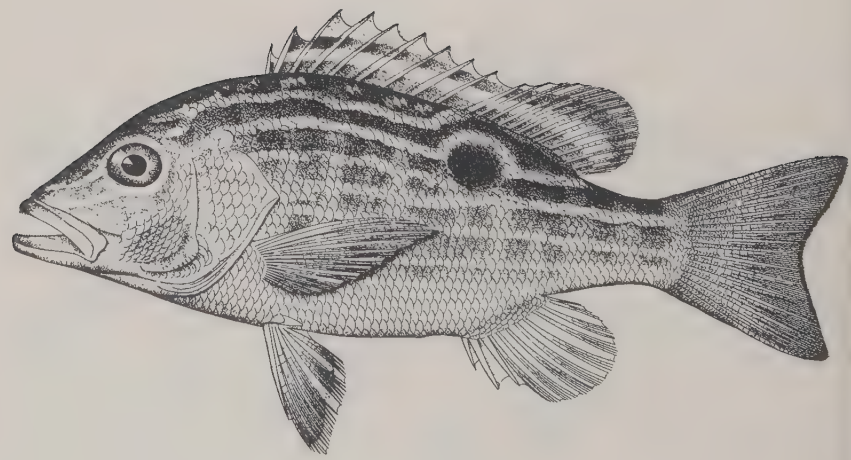


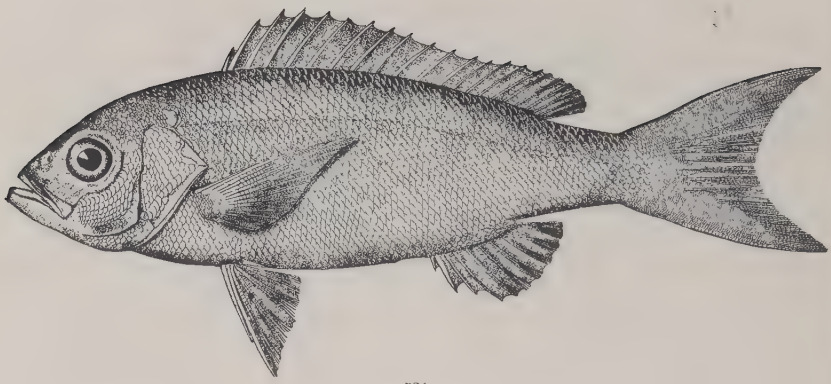
518

517. NEOMÆNIS ANALIS. (P. 1265.)
518. NEOMÆNIS SYNAGRIS. (P. 1270.)

519

520

519. Rabirubia inermis. (P. 1274.)
520. Ocyurus chrysurus. (P. 1275.)



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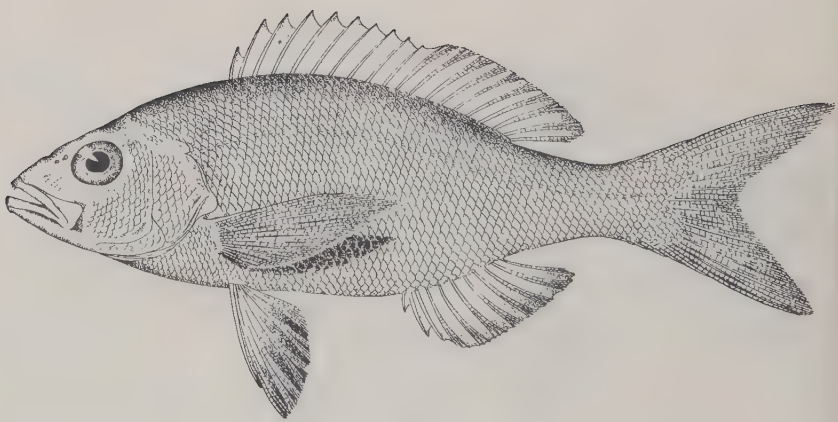
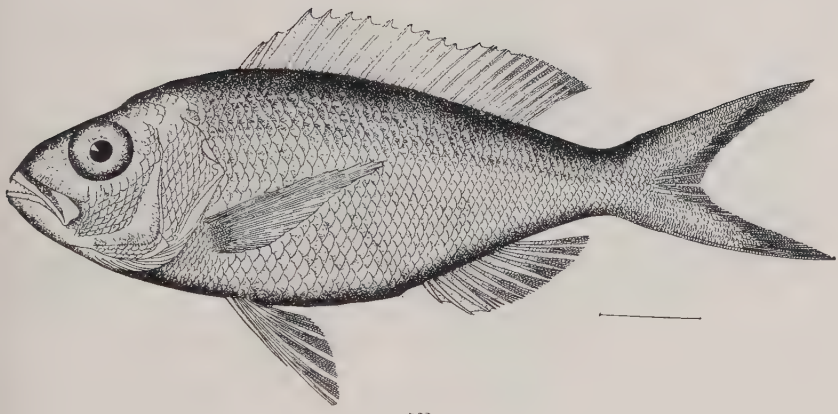


522

521. Rhomboplites aurorubens. (P. 1277.)
522. Apsilus dentatus. (P. 1278.)



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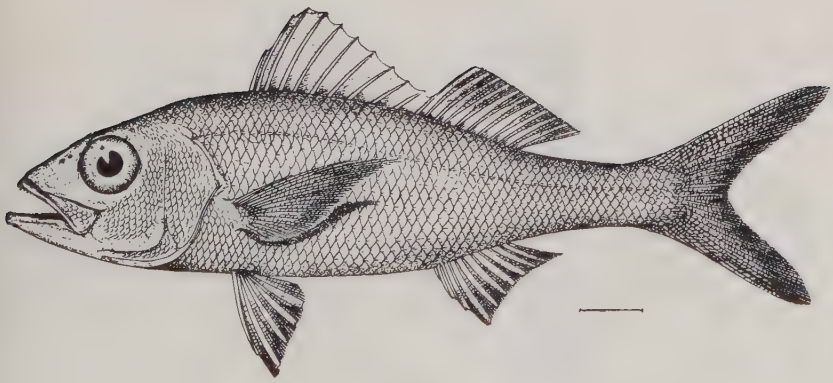
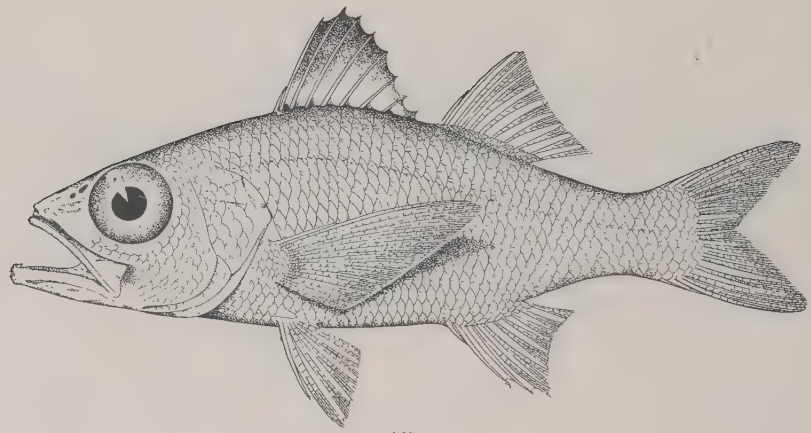


524

523. APRION MACROPHTHALMUS. (P. 1280.)
524. ETELIS OCULATUS. (P. 1282.)



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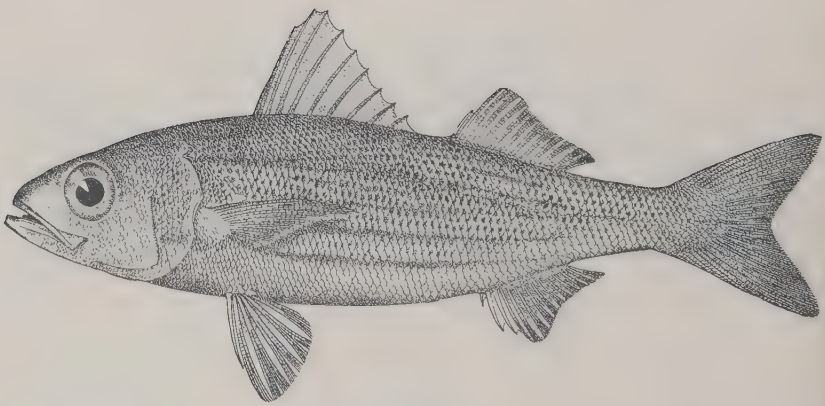
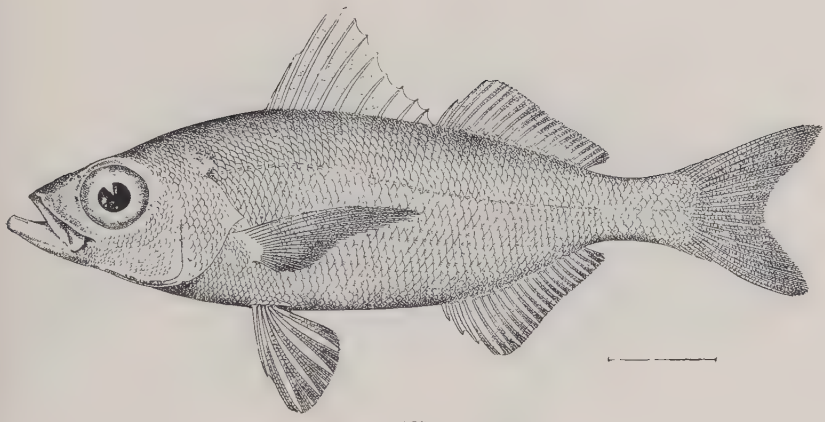


526

525. VERILUS SORDIDUS. (P. 1284.)
526. XENOCYS JESSIÆ. (P. 1285.)



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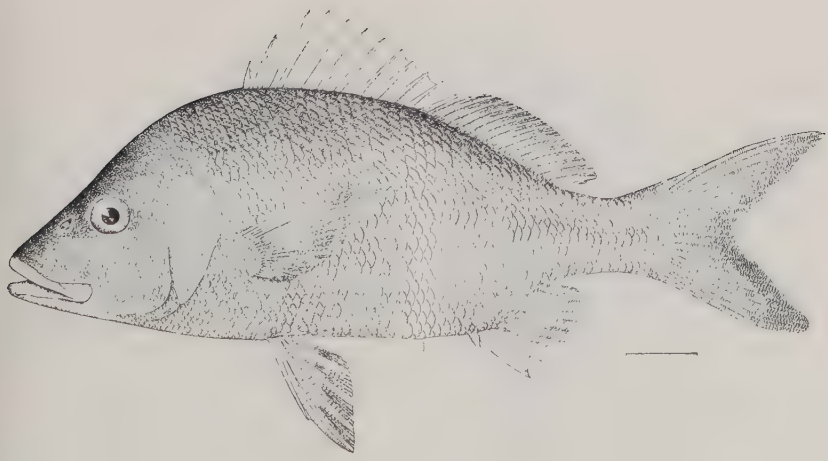
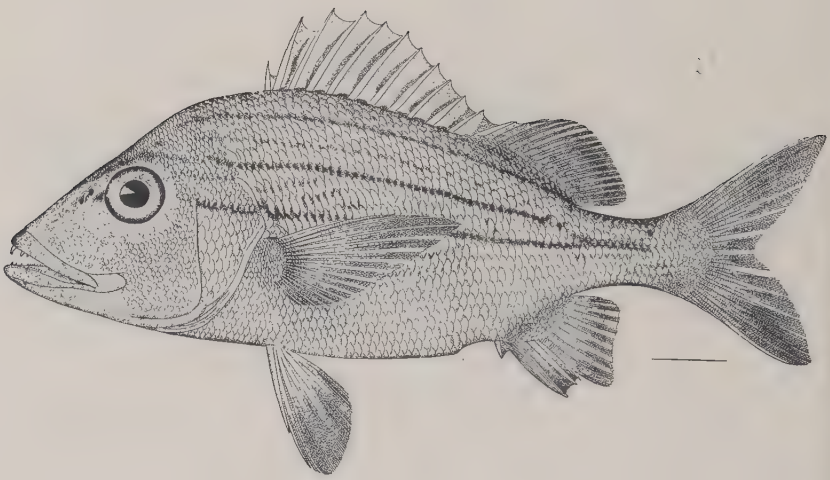


528

527. Xenichthys agassizii. (P. 1287.)
528. Hæmulon album. (P. 1295.)



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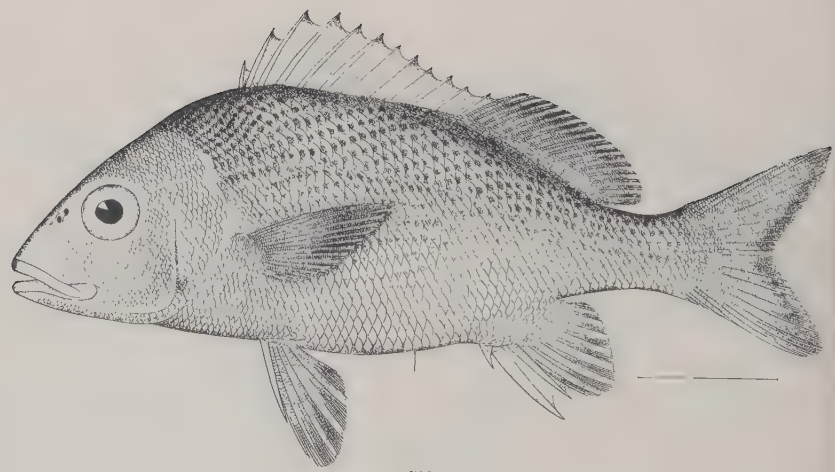
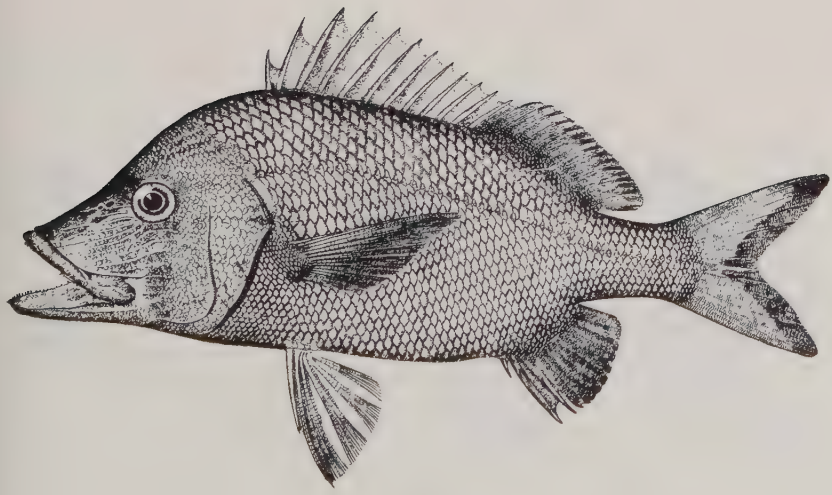


530

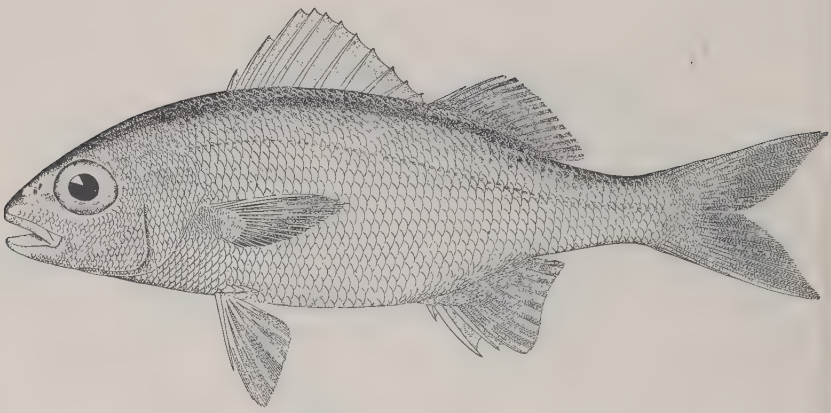
529. HÆMULON MACROSTOMUM. (P. 1296.)
530. HÆMULON PARRA. (P. 1297.)

531



532

531. HÆMULON SCIURUS. (P. 1303.)
532. HÆMULON PLUMIERI. (P. 1304.)



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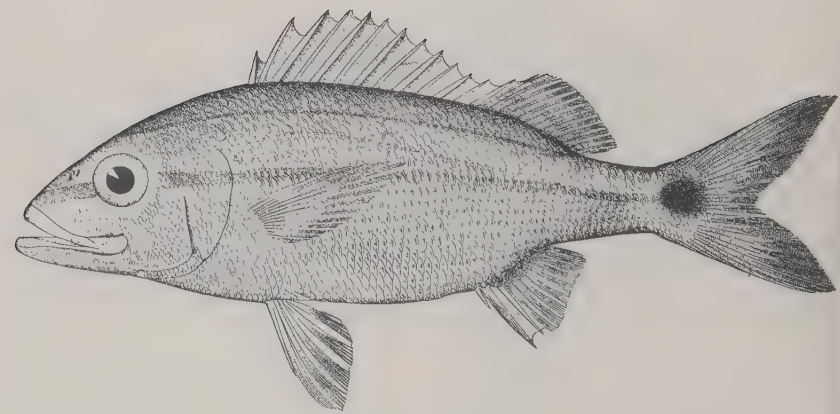
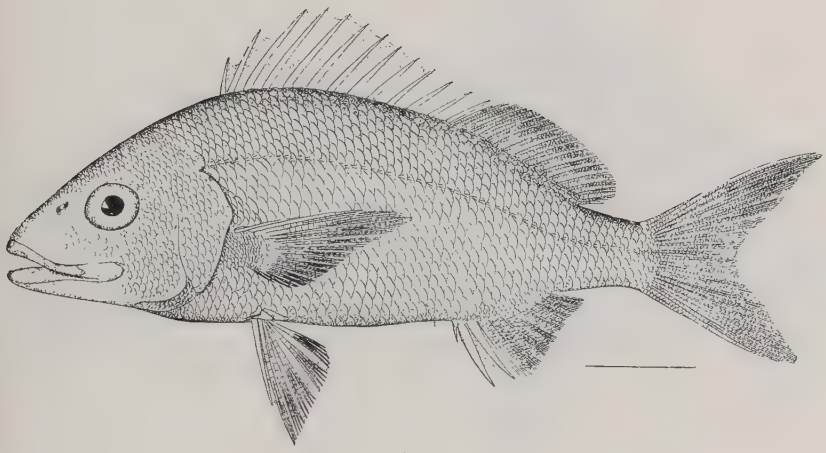


534

533. Brachygenys chrysargyreus. (P. 1307.)
534. Bathystoma rimator. (P. 1308.)



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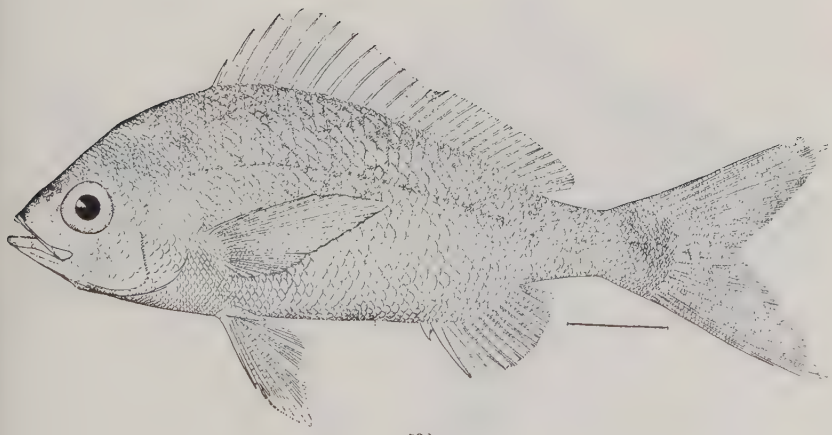
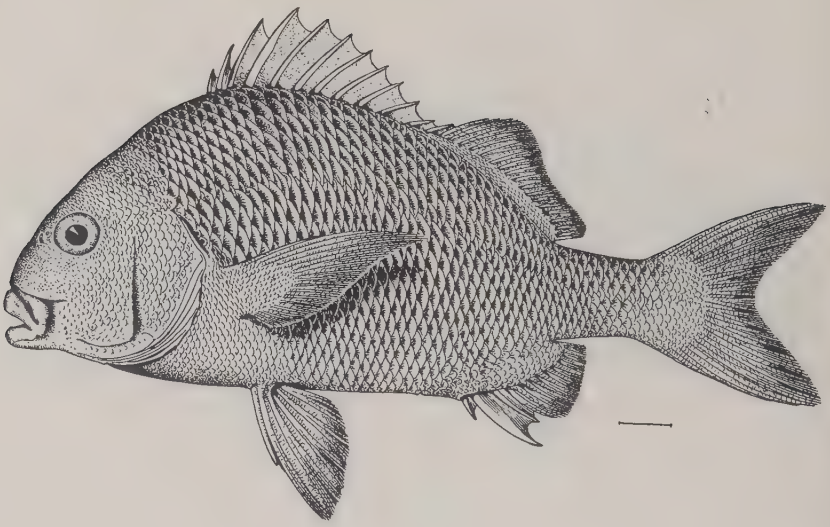


536

535. Bathystoma aurolineatum. (P. 1310.)
536. Lythrulon opalescens. (P. 1312.)



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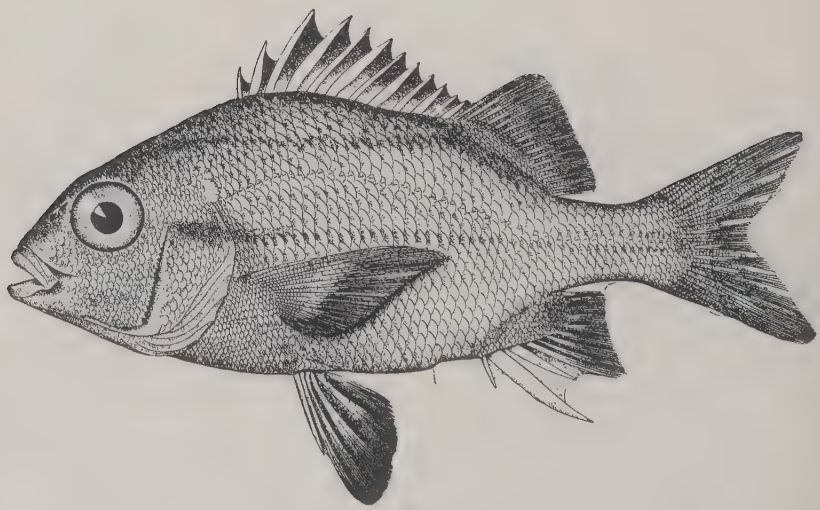
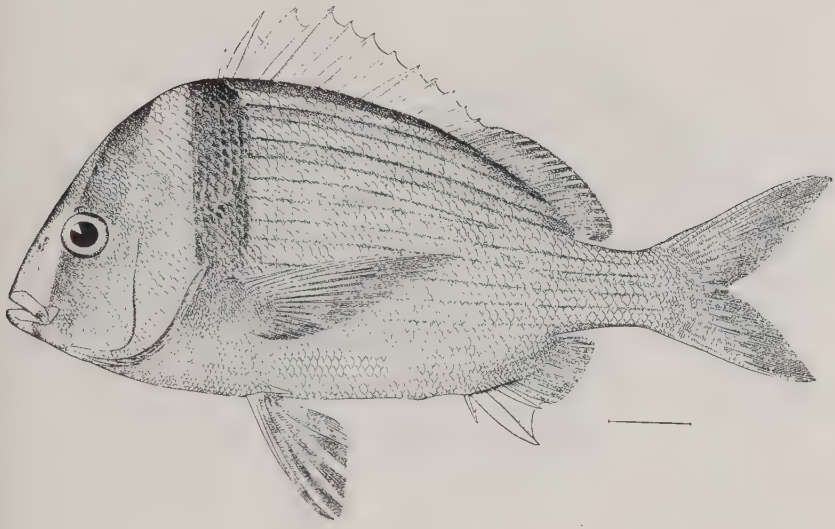


538

537. ANISOTREMUS SURINAMENSIS. (P. 1318.)
538. ANISOTREMUS BILINEATUS. (P. 1319.)



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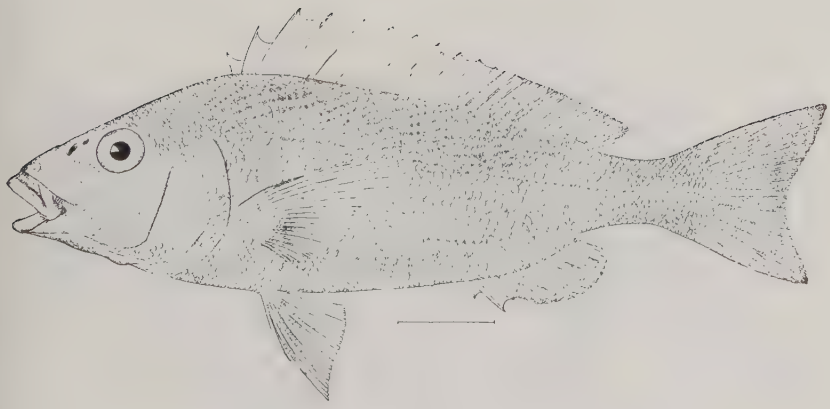
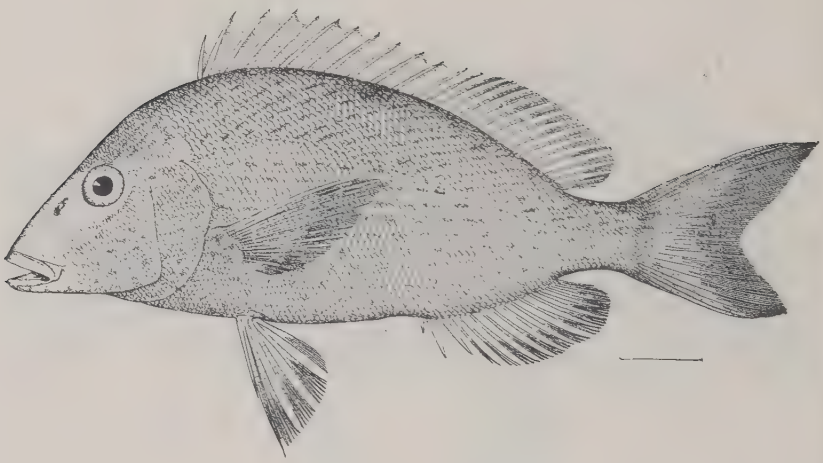


540

539. ANISOTREMUS VIRGINICUS. (P. 1322.)
540. ORTHOPRISTIS REDDINGI. (P. 1336.)



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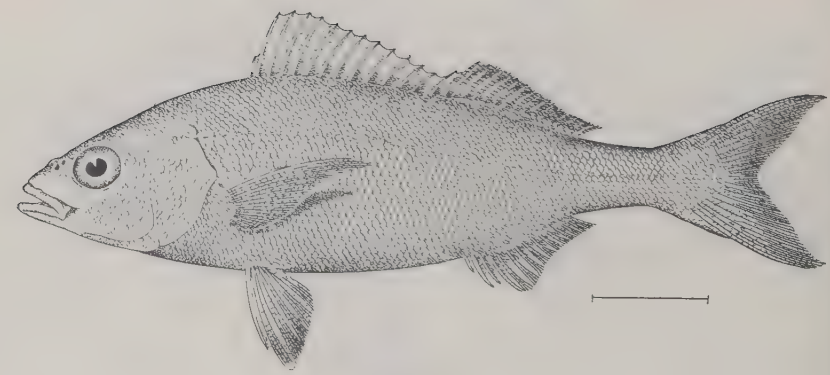


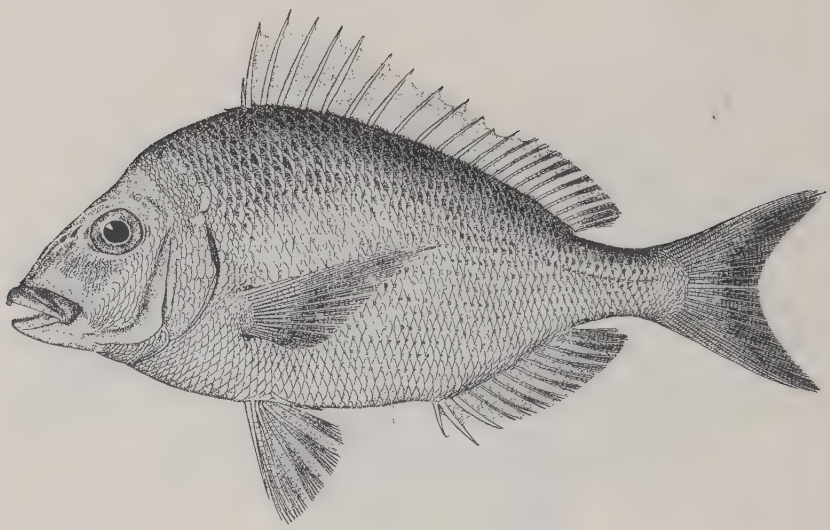
542

541. Orthopristis chrysopterus. (P. 1338.)
542. Microlepidotus inornatus. (P. 1341.)

543

544

543. Otrynter caprinus. (P. 1345.)
544. Stenotomus chrysops. (P. 1346.)



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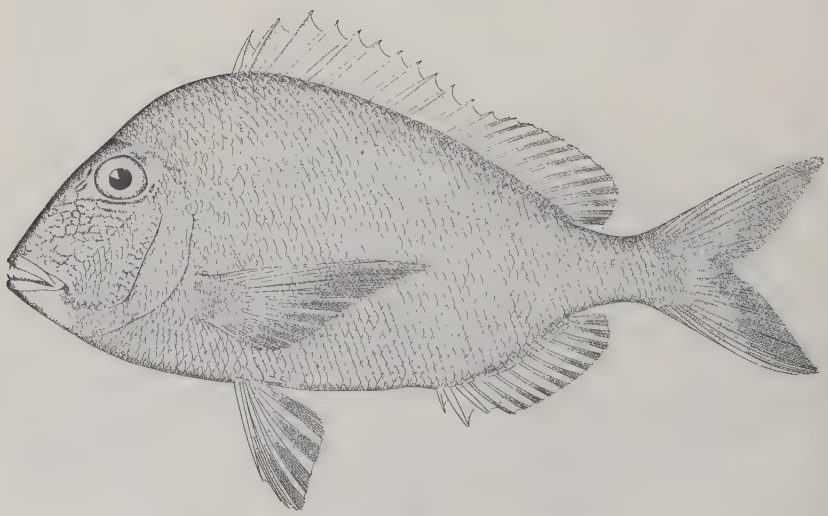


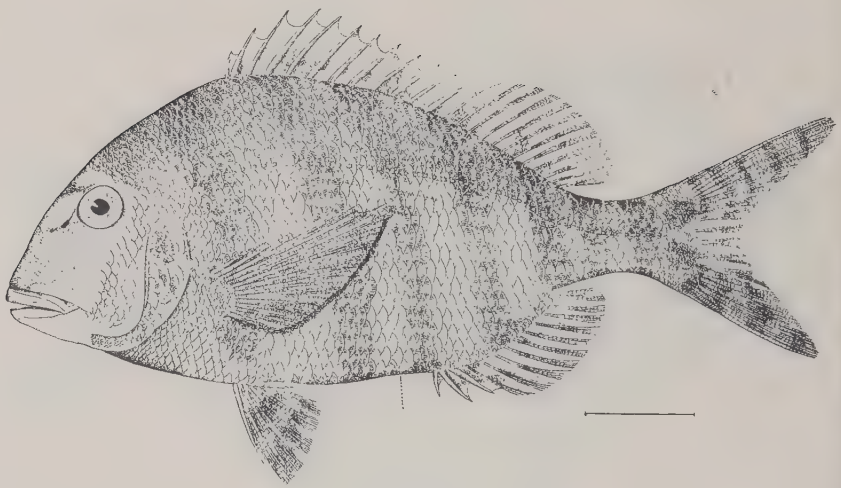
546

545. Stenotomus aculeatus. (P. 1346.)
546. Calamus calamus. (P. 1349.)

547

548

547. Calamus proridens. (P. 1350.)
548. Calamus bajonado. (P. 1352.)



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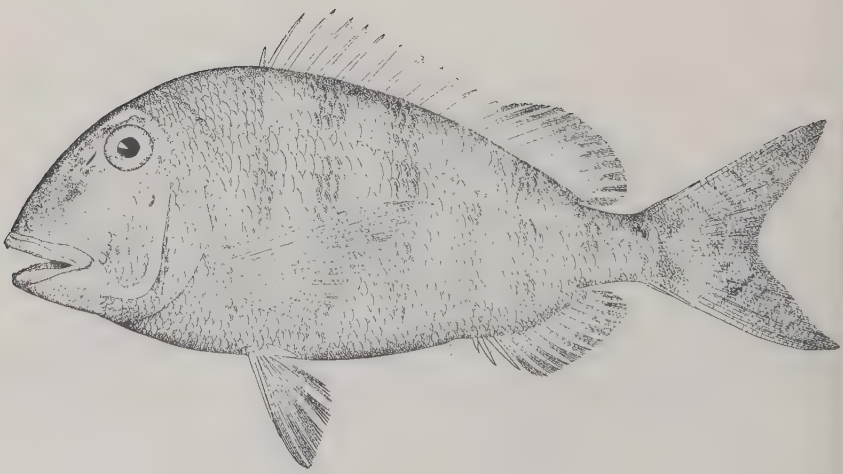


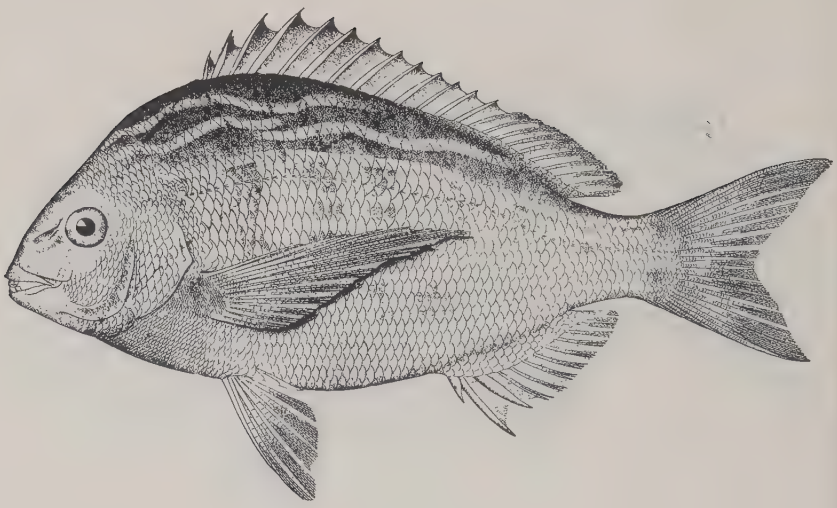
550

549. Calamus penna. (P. 1354.)
550. Calamus arctifrons. (P. 1355.)

551

552

551. Pagrus pagrus. (P. 1356.)
552. Lagodon rhomboides. (P. 1358.)



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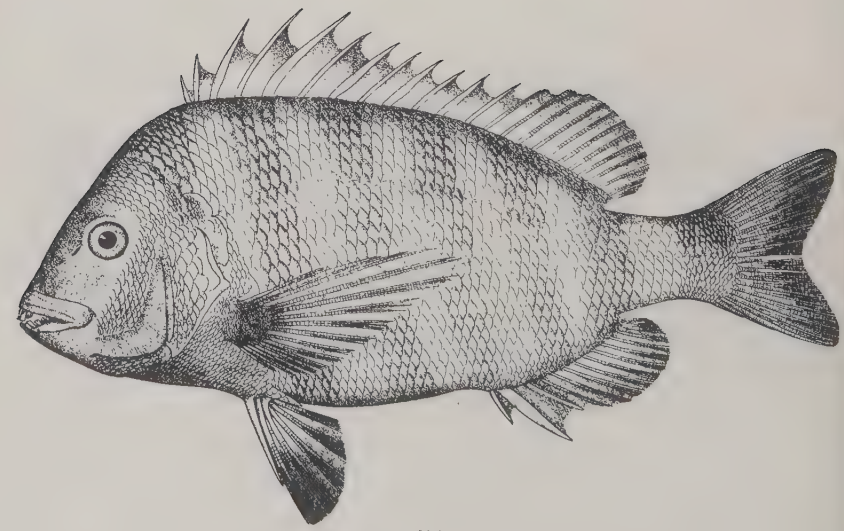
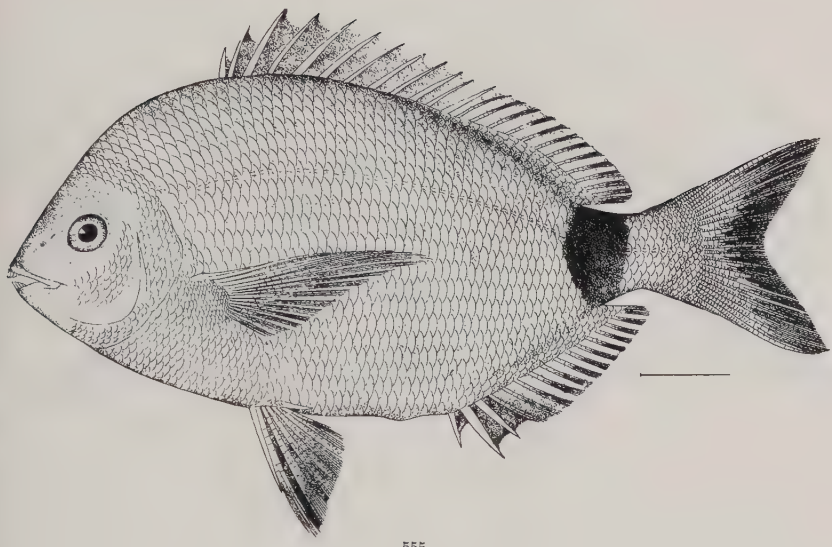


554

553. ARCHOSARGUS UNIMACULATUS. (P. 1359.)
554. ARCHOSARGUS PROBATOCEPHALUS. (P. 1361.)

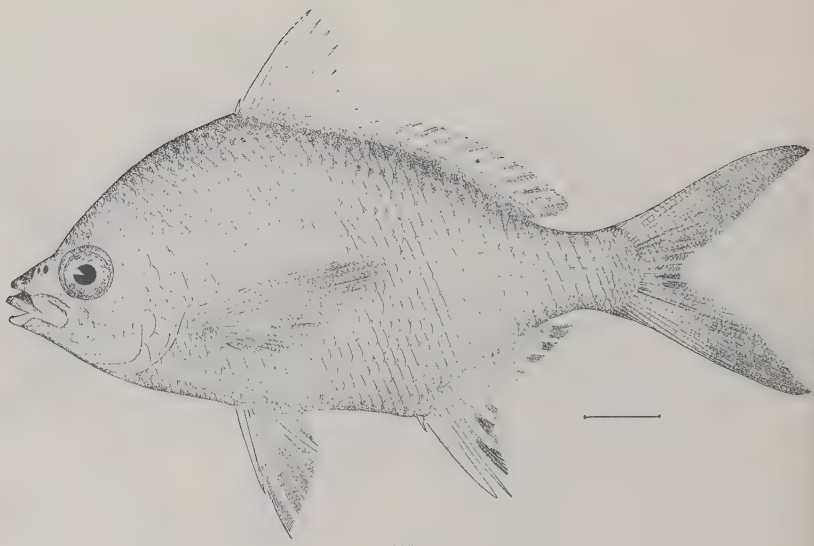


555

555*a*

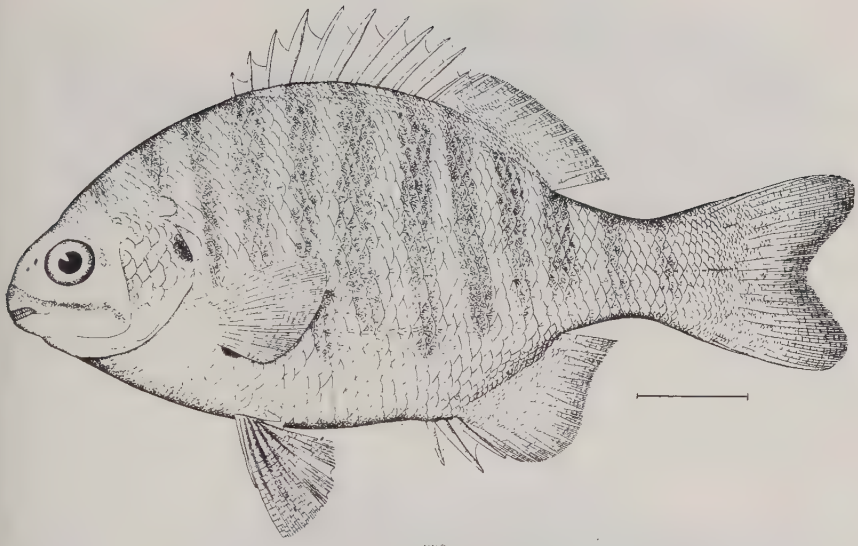
555. DIPLODUS HOLBROOKII. (P. 1362.)
555*a*. DIPLODUS HOLBROOKII; young. (P. 1362.)

556



557

556. Xystema cinereum. (P. 1372.)
557. Gerres olisthostomus. (P. 1376.)



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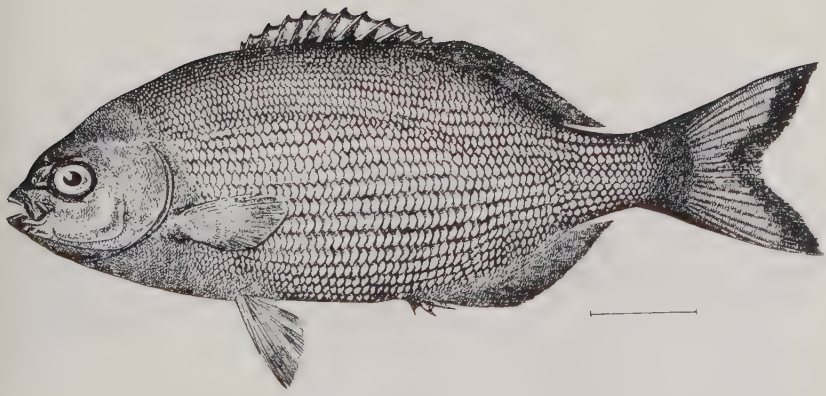
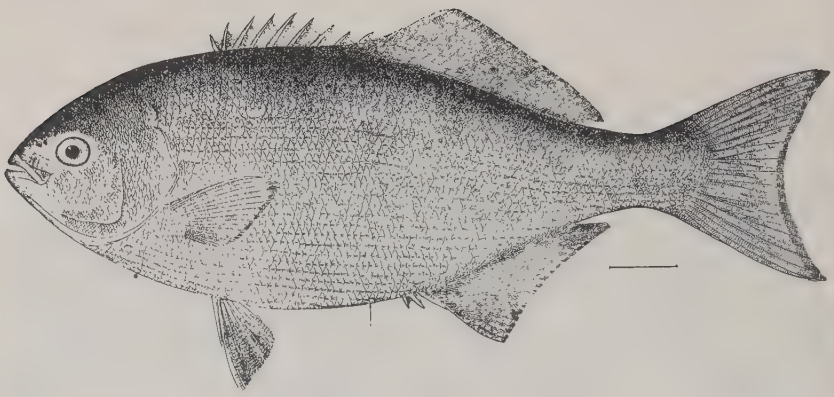


559

558. Hermosilla azurea. (P. 1383.)
559. Kyphosus sectatrix. (P. 1387.)



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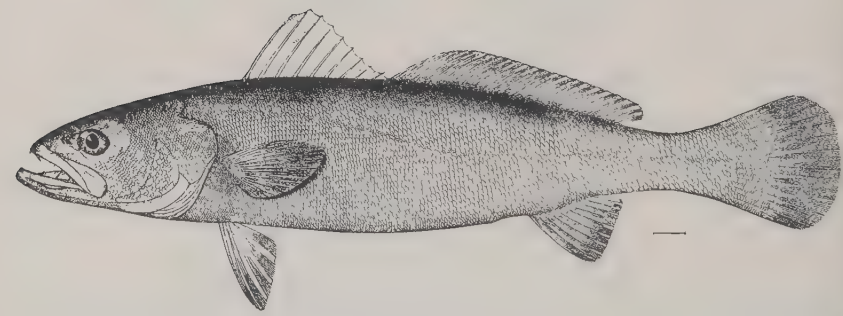
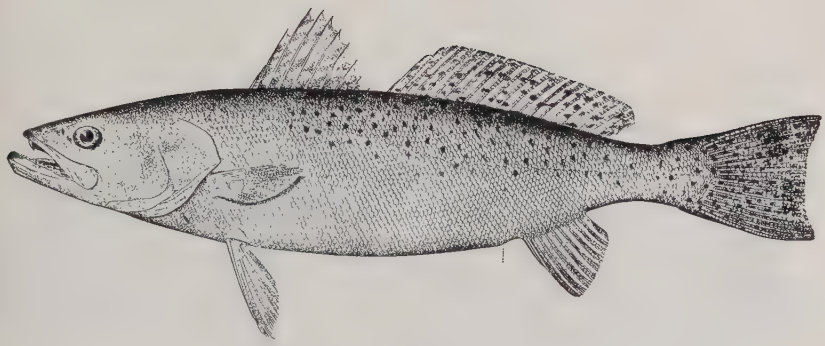


561

562

560. MEDIALUNA CALIFORNIENSIS. (P. 1391.)
561. CYNOSCION NOTHUS. (P. 1406.)
562. CYNOSCION REGALIS. (P. 1407.)



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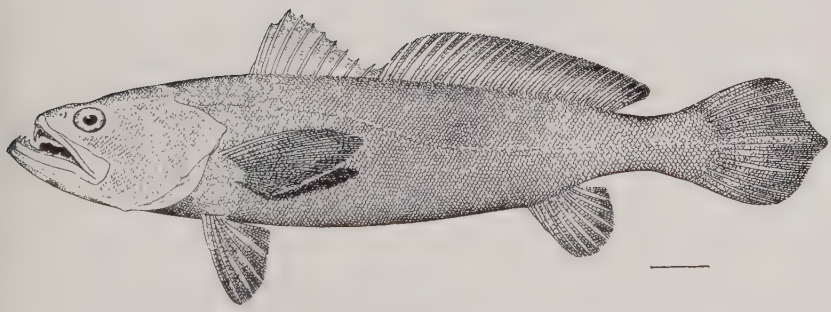

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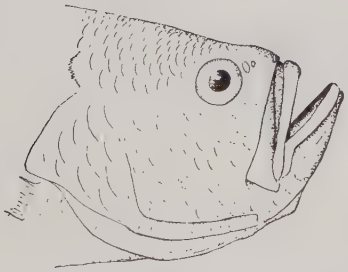
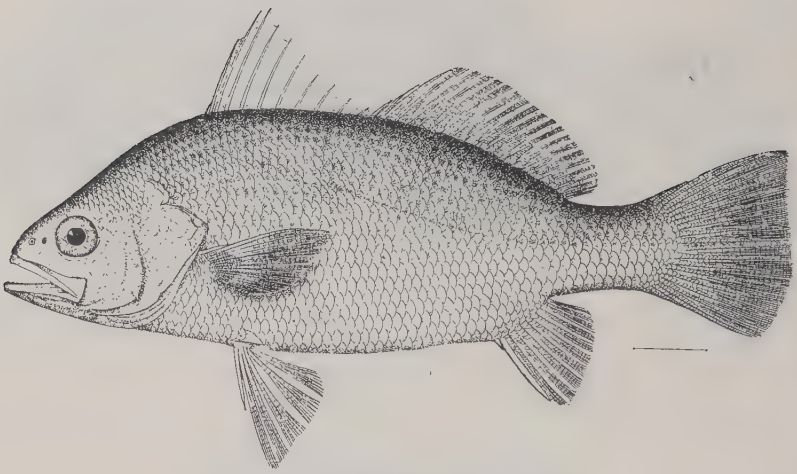


565

563. Cynoscion nebulosus. (P. 1409.)
564. Sagenichthys ancylodon. (P. 1416.)
565. Larimus argenteus. (P. 1421.)



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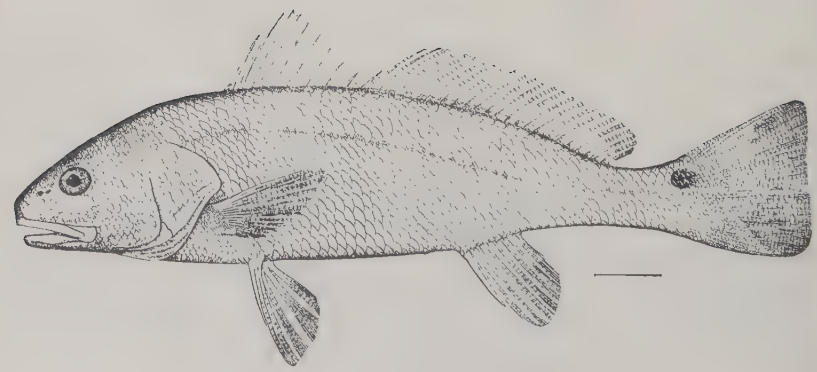
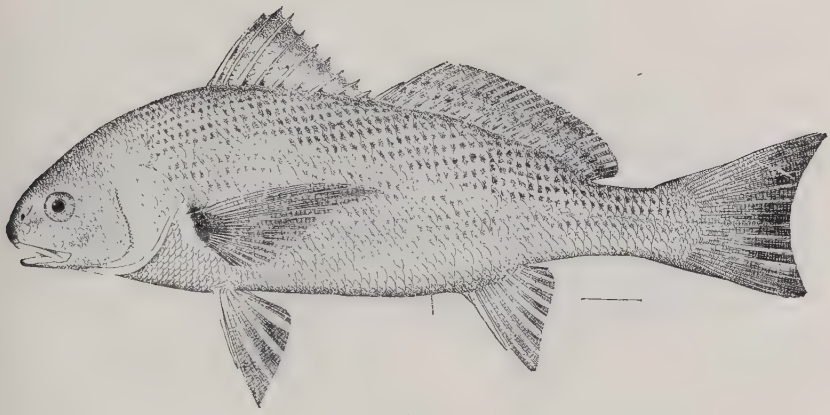


567

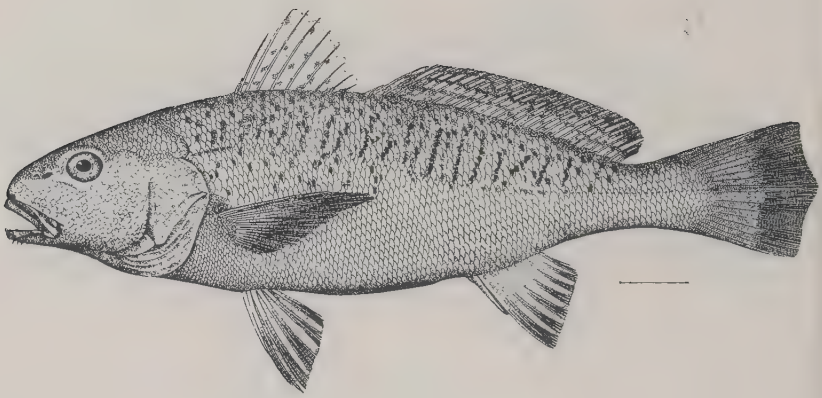
566. BAIRDIELLA CHRYSURA. (P. 1433.)
567. SCIÆNOPS OCELLATUS. (P. 1453.)



568

569

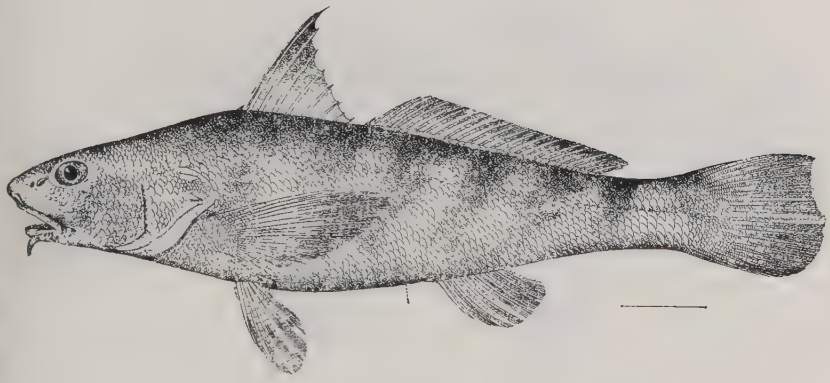
568. Roncador stearnsi. (P. 1457.)
569. Leiostomus xanthurus. (P. 1458.)



570

571

570. MICROPOGON UNDULATUS. (P. 1461.)
571. UMBRINA SINALOÆ. (P. 1468.)



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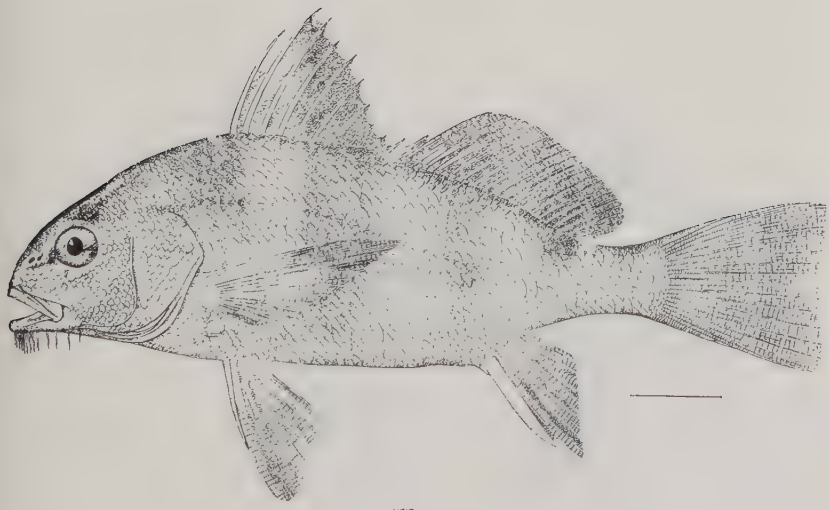
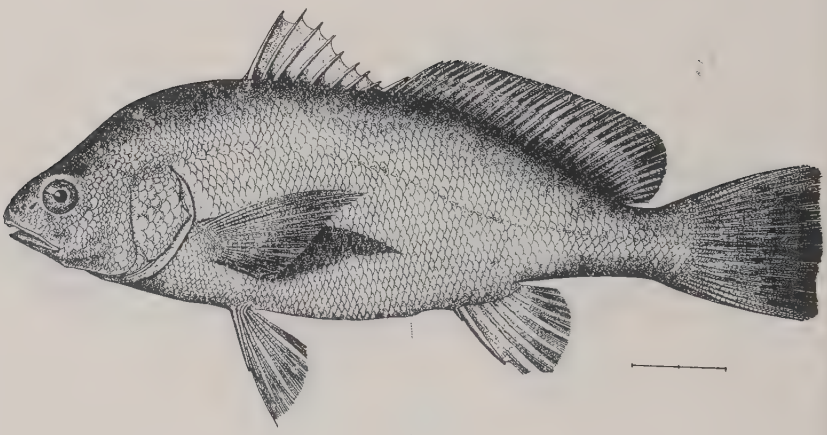


573

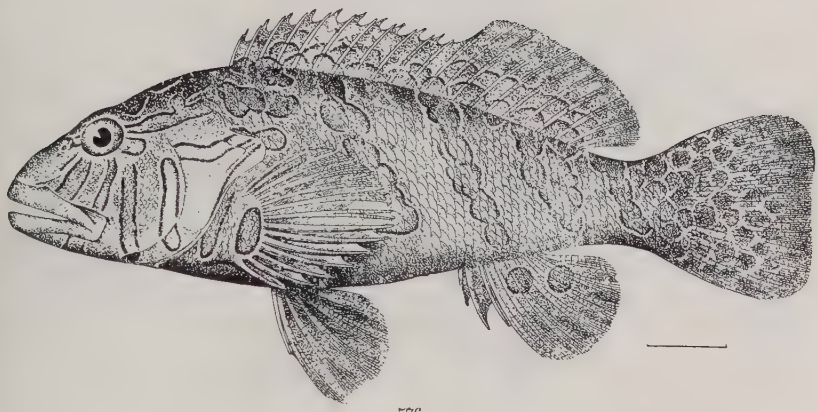
572. MENTICIRRHUS AMERICANUS. (P. 1474.)
573. POGONIAS CHROMIS. (P. 1482.)



574

575

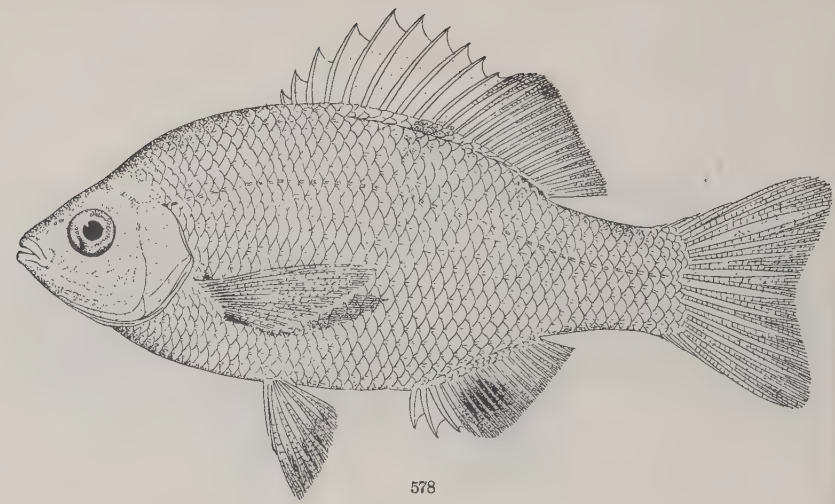
574. APLODINOTUS GRUNNIENS. (P. 1484.)
575. EQUES LANCEOLATUS. (P. 1489.)



576

577

576. Cirrhites rivulatus. (P. 1491.)
577. Hysterocarpus traski. (P. 1496.)



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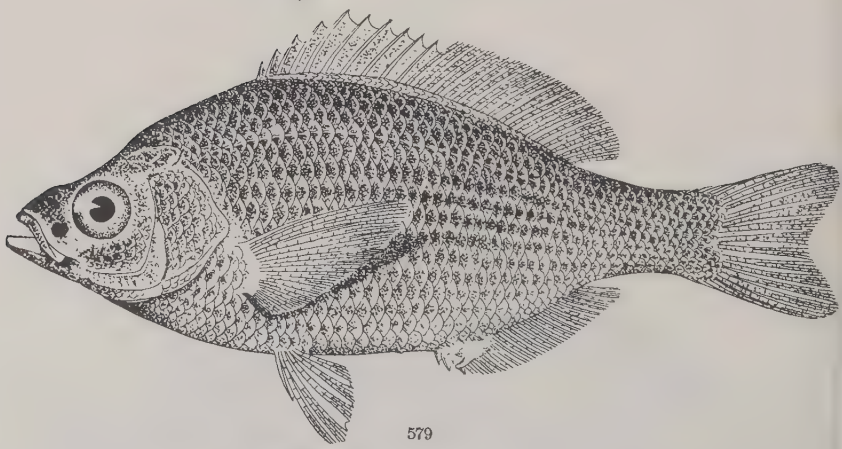
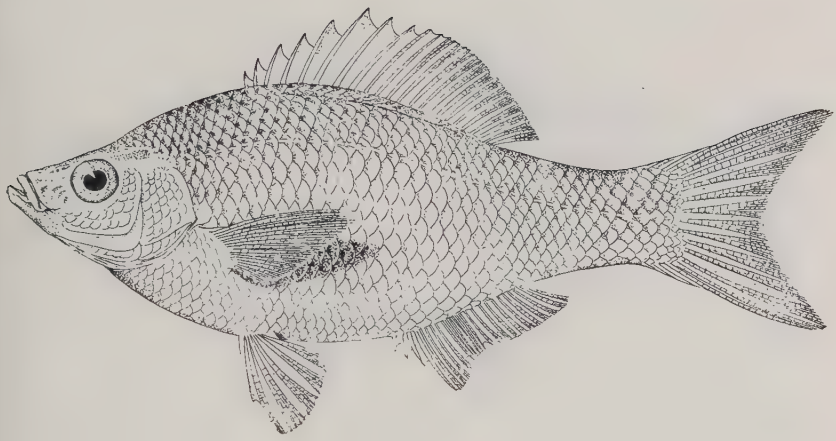


579

579*a*

578. ABEONA MINIMA. (P. 1497.)
579. CYMATOGASTER AGGREGATUS. (P. 1498.)
579*a*. CYMATOGASTER AGGREGATUS; female. (P. 1498.)



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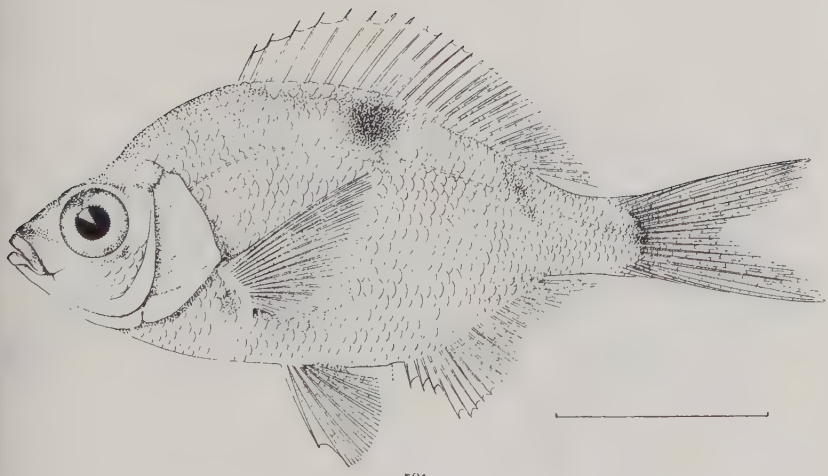
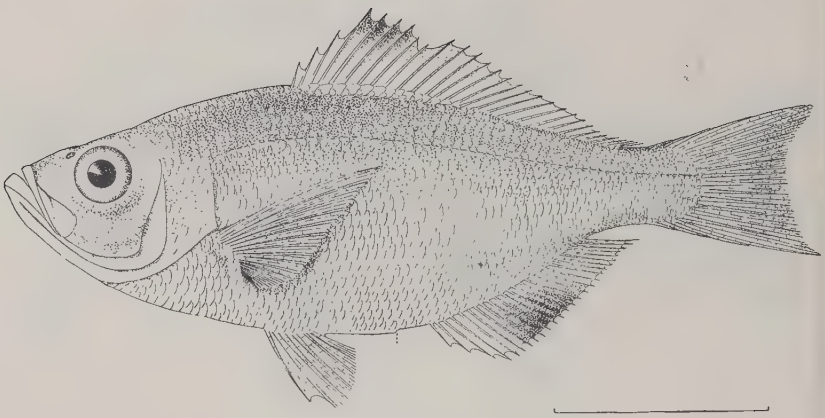


581

580. Brachyistius frenatus. (P. 1499.)
581. Zalembius rosaceus. (P. 1500.)



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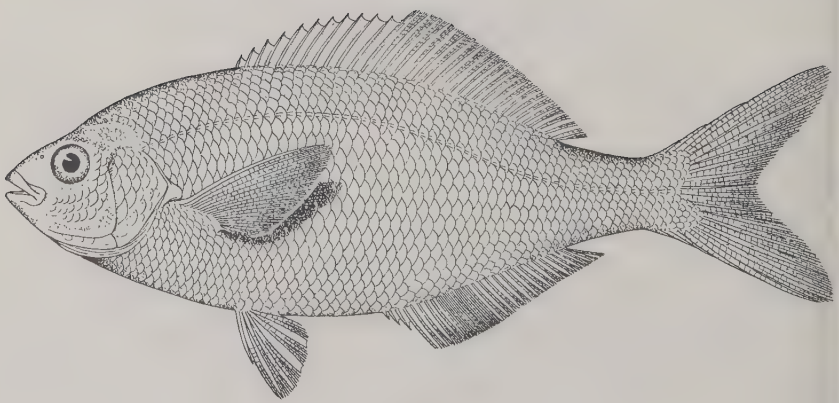
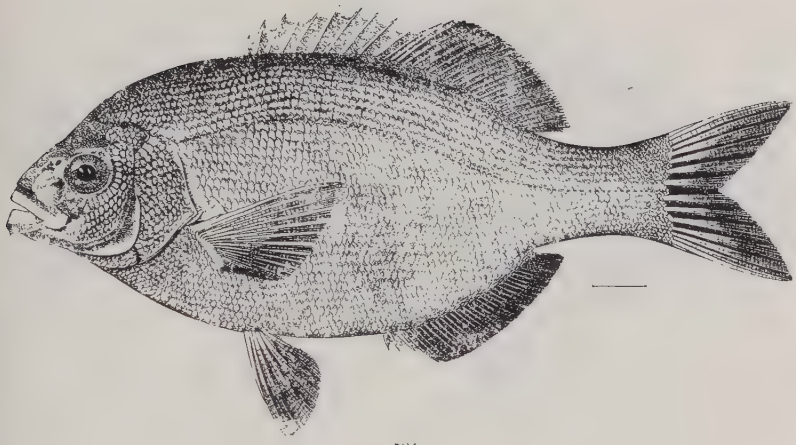


583

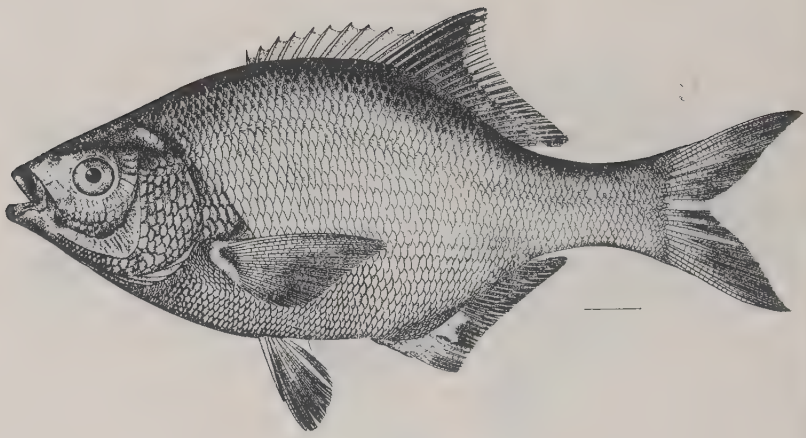
582. Hypocritichthys analis. (P. 1500.)
583. Phanerodon furcatus. (P. 1506.)



584

585

584. Rhacochilus toxotes. (P. 1507.)
585. Hypsurus caryi. (P. 1508.)



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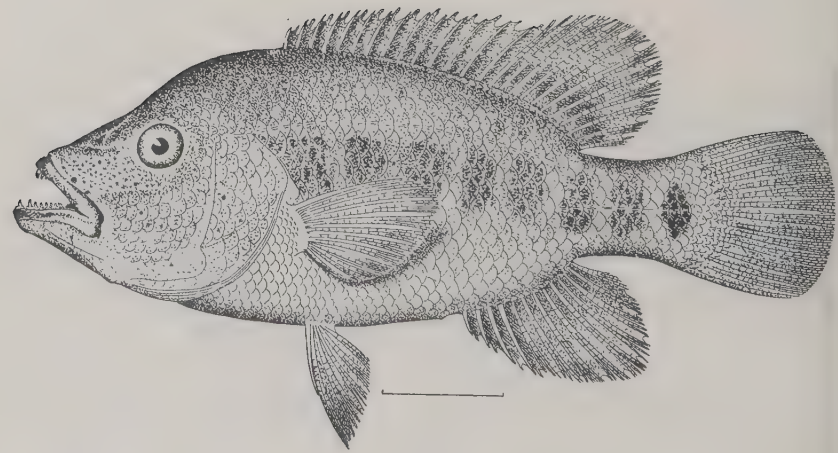
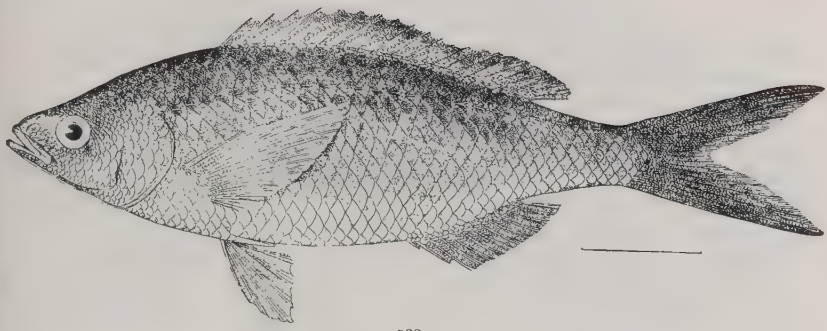


587

586. Damalichthys argyrosomus. (P. 1509.)
587. Cichlasoma bartoni. (P. 1515.)



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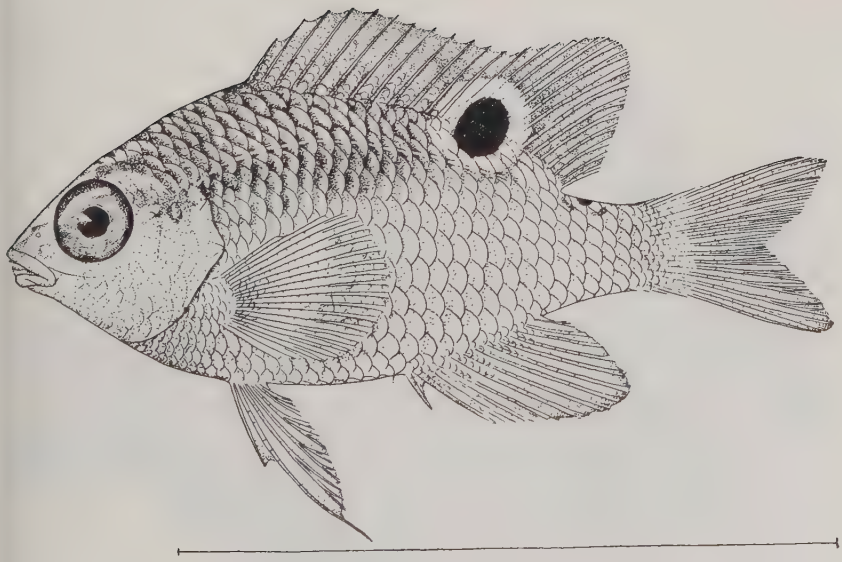
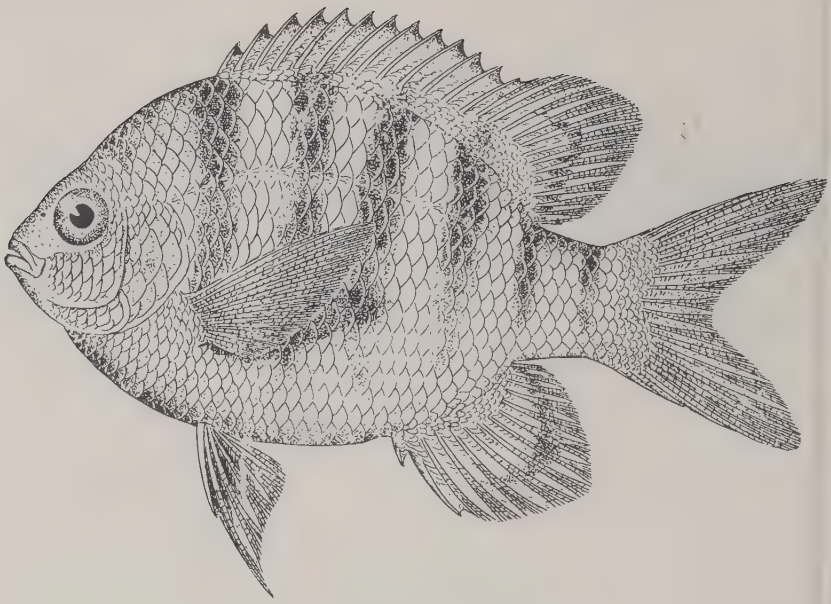


589

588. AZURINA HIRUNDO. (P. 1544.)
589. EUPOMACENTRUS FLAVILATUS. (P. 1557.)



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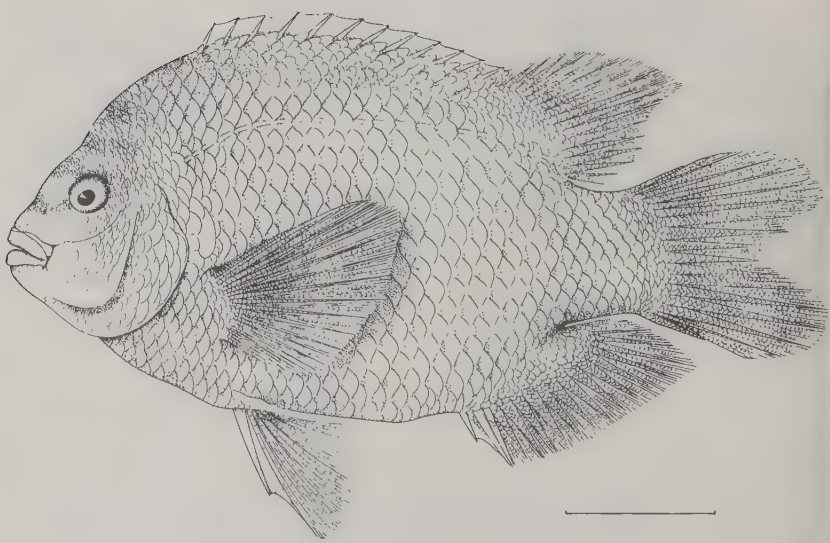
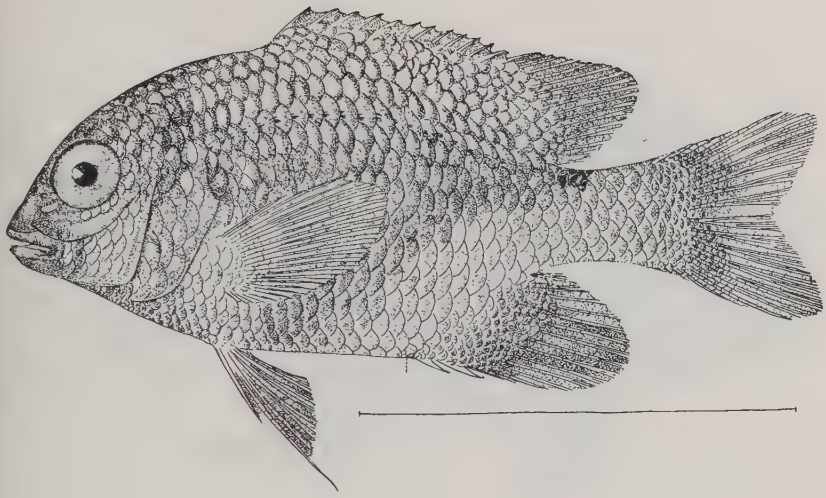


591

590. ABUDEFDUF SAXATILIS. (P. 1561.)
591. HYPSYPOPS RUBICUNDUS. (P. 1564.)



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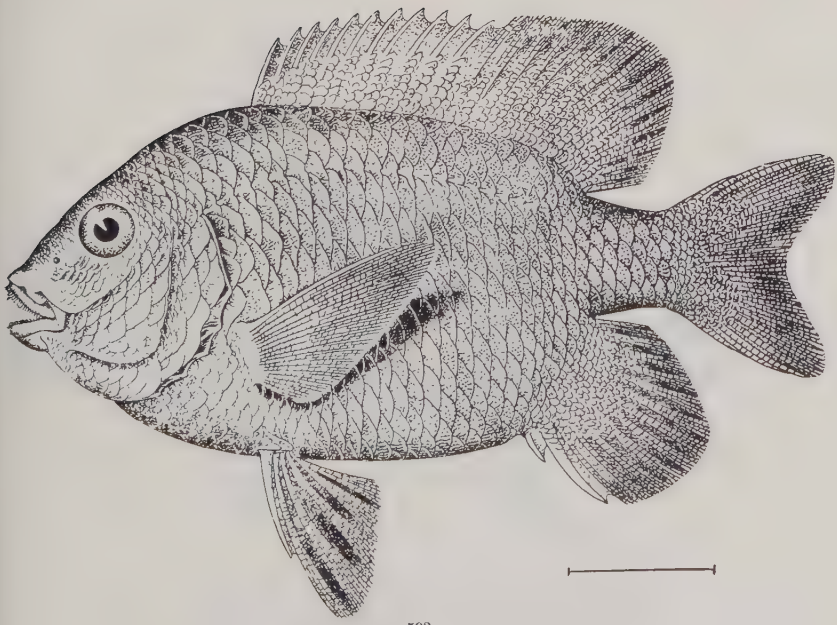
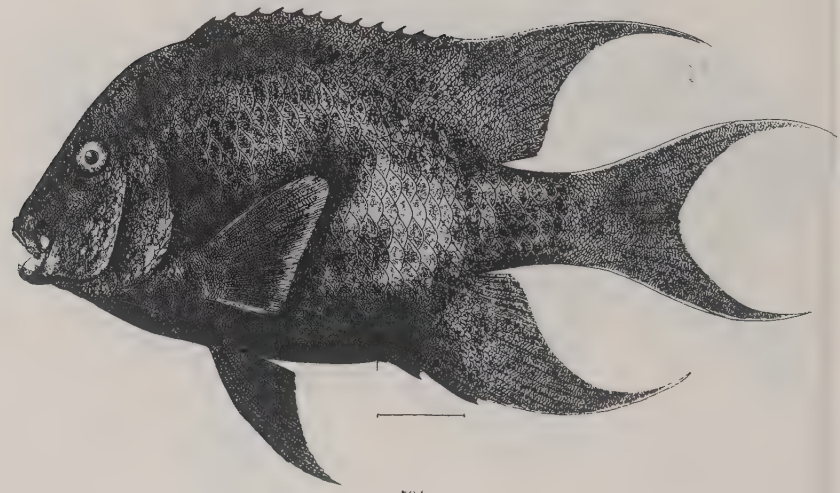


593

592. MICROSPATHODON BAIRDII. (P. 1566.)
593. MICROSPATHODON CHRYSURUS. (P. 1567.)



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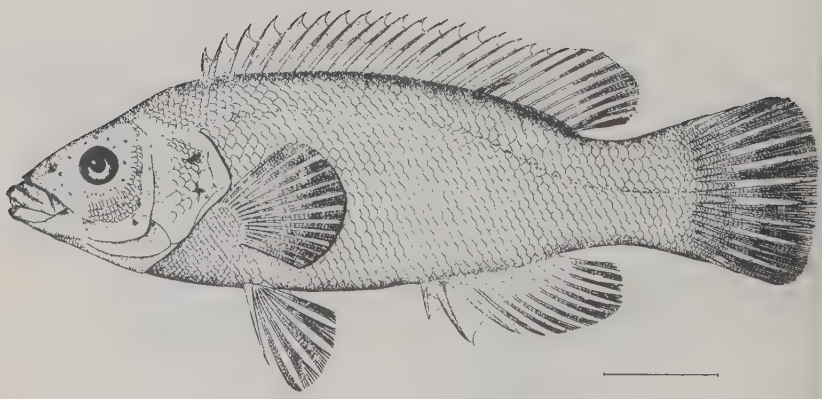
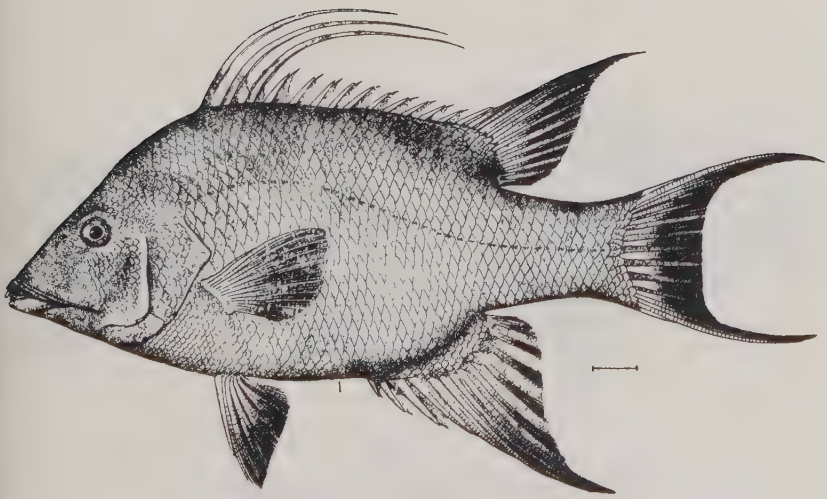


595

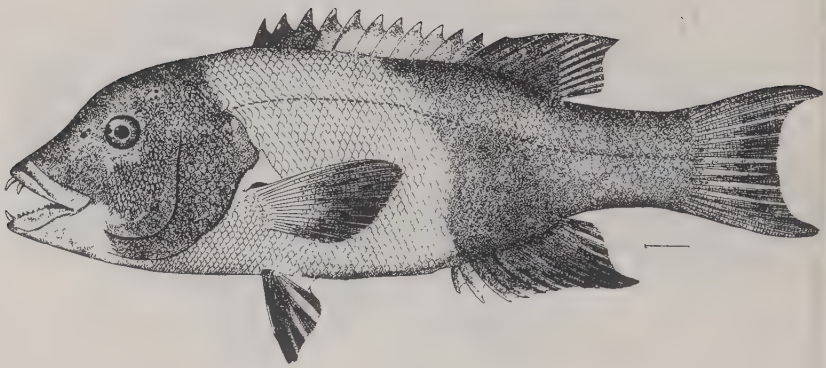
594. MICROSPATHODON DORSALIS. (P. 1568.)
595. TAUTOGOLABRUS ADSPERSUS. (P. 1577.)

596



597

596. TAUTOGA ONITIS. (P. 1578.)
597. LACHNOLAIMUS MAXIMUS. (P. 1579.)



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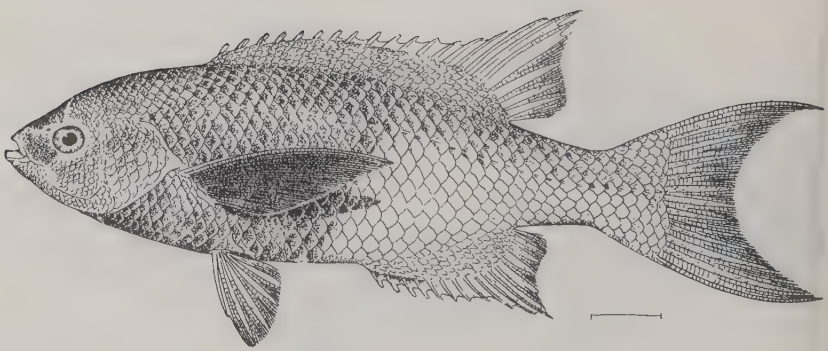
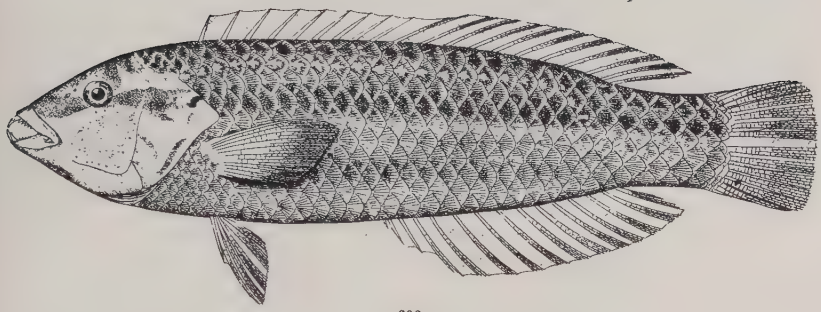


599

598. PIMELOMETOPON PULCHER. (P. 1585.)
599. CLEPTICUS PARRÆ. (P. 1586.)



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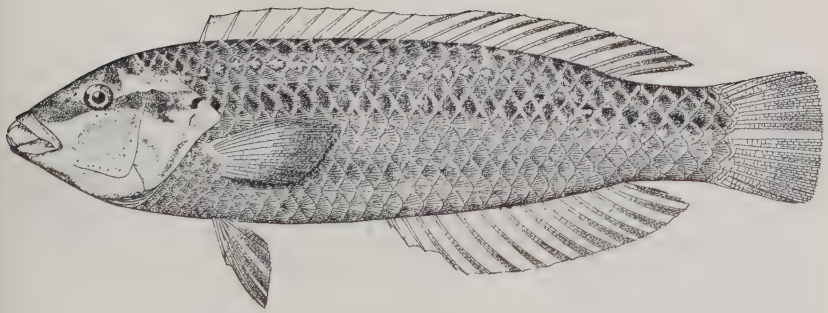
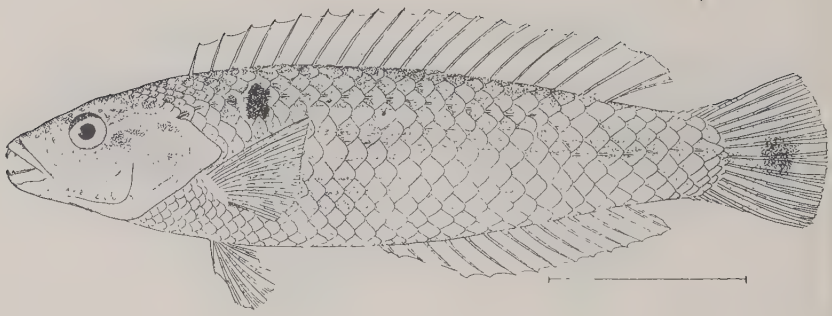


601

600. Iridio radiatus. (P. 1590.)
601. Iridio bivittatus. (P. 1595.)



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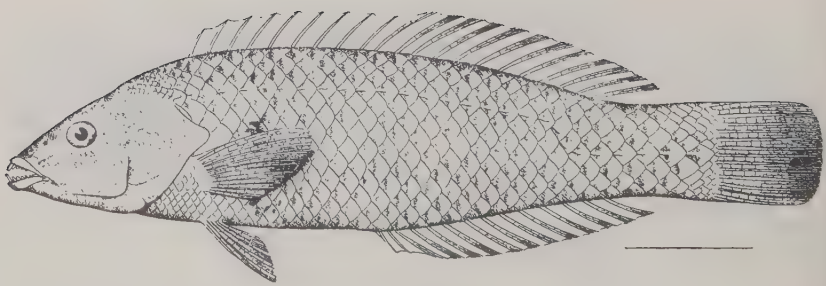
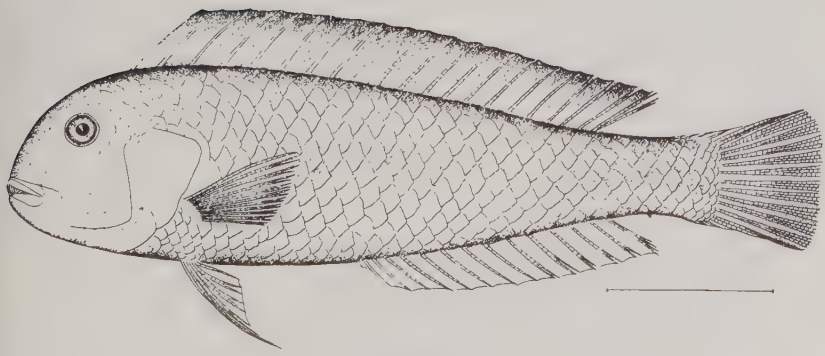


603

602. IRIDIO DISPILUS. (P. 1597.)
603. EMMEEKIA VENUSTA. (P. 1602.)

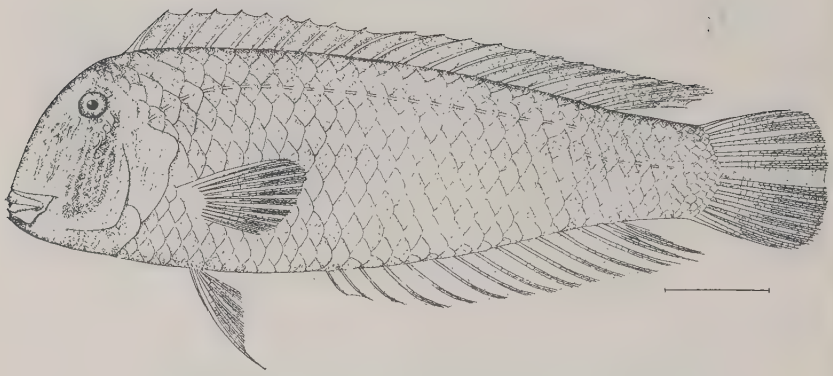
604

605



606

604. CHLORICHTHYS GRAMMATICUS. (P. 1610.)
605. NOVACULICHTHYS VENTRALIS. (P. 1615.)
606. NOVACULICHTHYS INFIRMUS. (P. 1616.)



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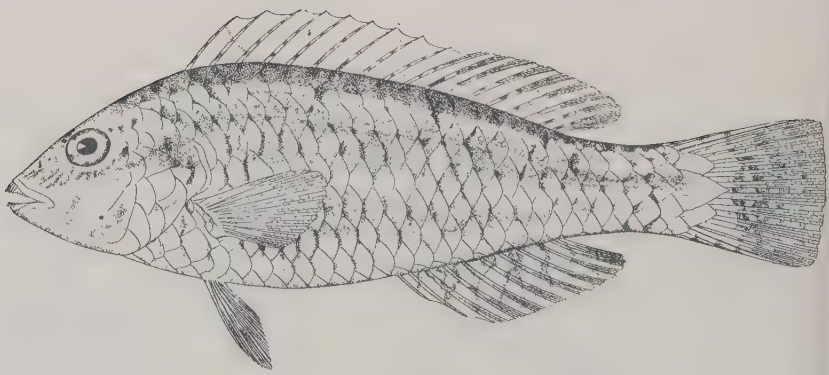
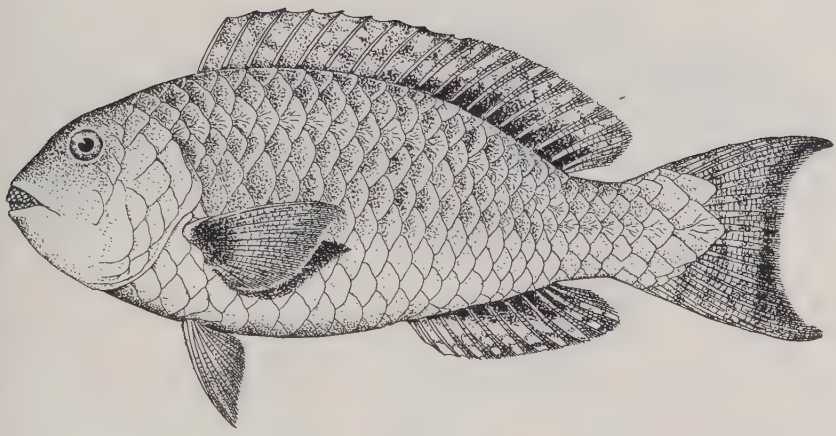


608

607. XYRICHTHYS PSITTACUS. (P. 1618.)
608. CRYPTOTOMUS BERYLLINUS. (P. 1625.)



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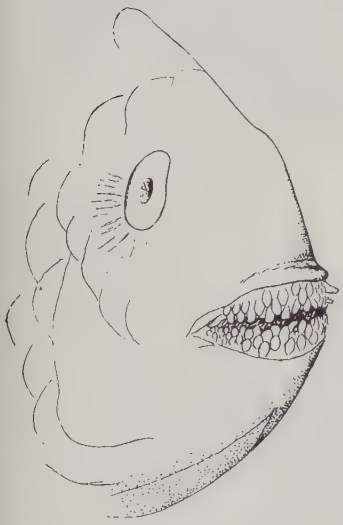
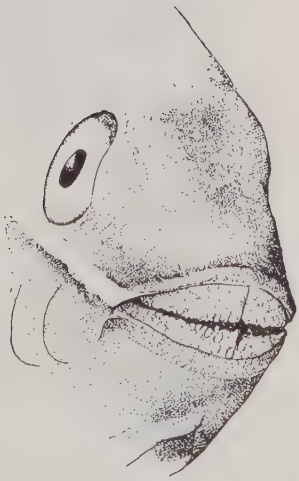


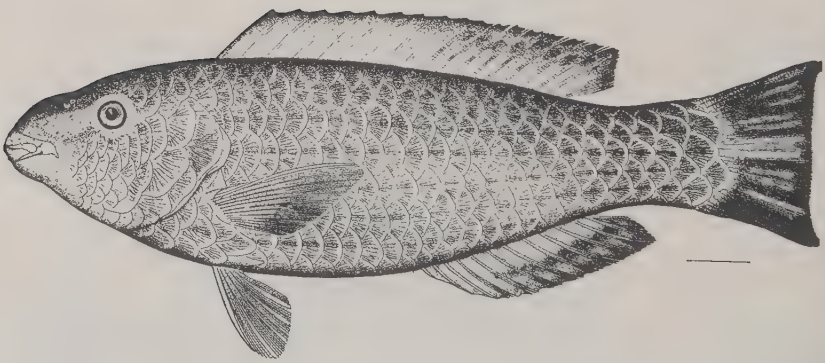
609*a*



610

609, 609*a*. CALOTOMUS XENODON. (P. 1626.)
610. SPARISOMA AUROFRENATUM. (P. 1634.)

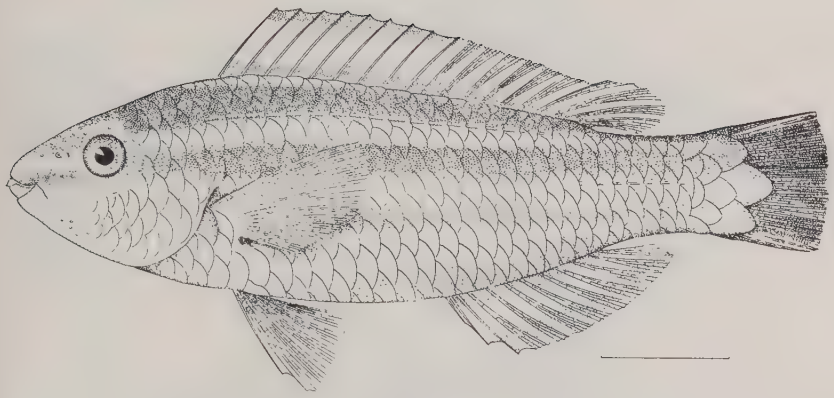
611



612

613

611. Sparisoma hoplomystax. (P. 1632.)
612. Scarus cuzamilæ. (P. 1648.)
613. Jaws of Scarus cæruleus. (P. 1652.)



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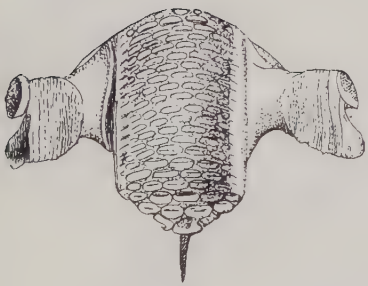

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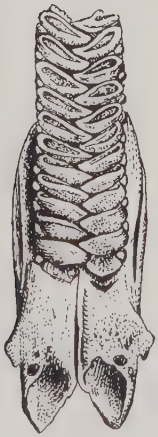
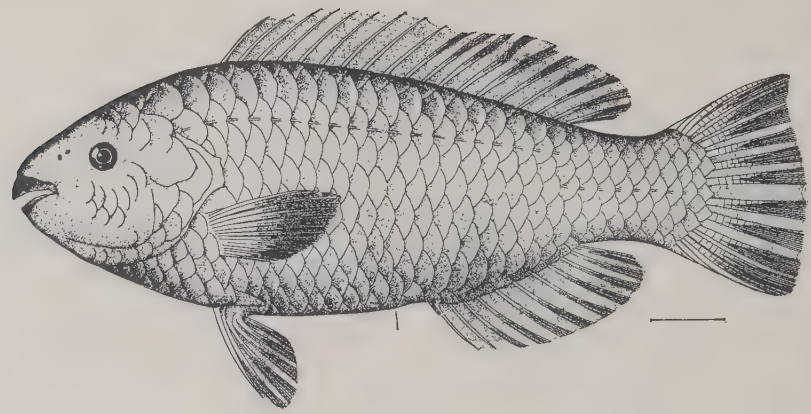


615*a*

616

616*a*

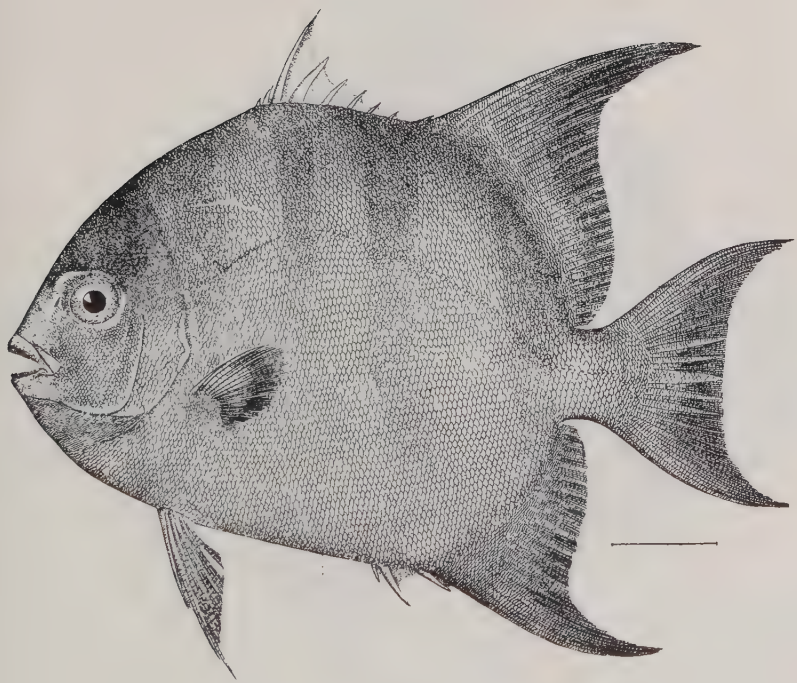
614. SCARUS EMBLEMATICUS. (P. 1654.)
615, 615*a*. LOWER AND UPPER PHARYNGEAL BONES OF SCARUS STRONGYLOCEPHALUS.
616, 616*a*. LOWER AND UPPER PHARYNGEAL BONES OF SPARISOMA CRETENSE.



617

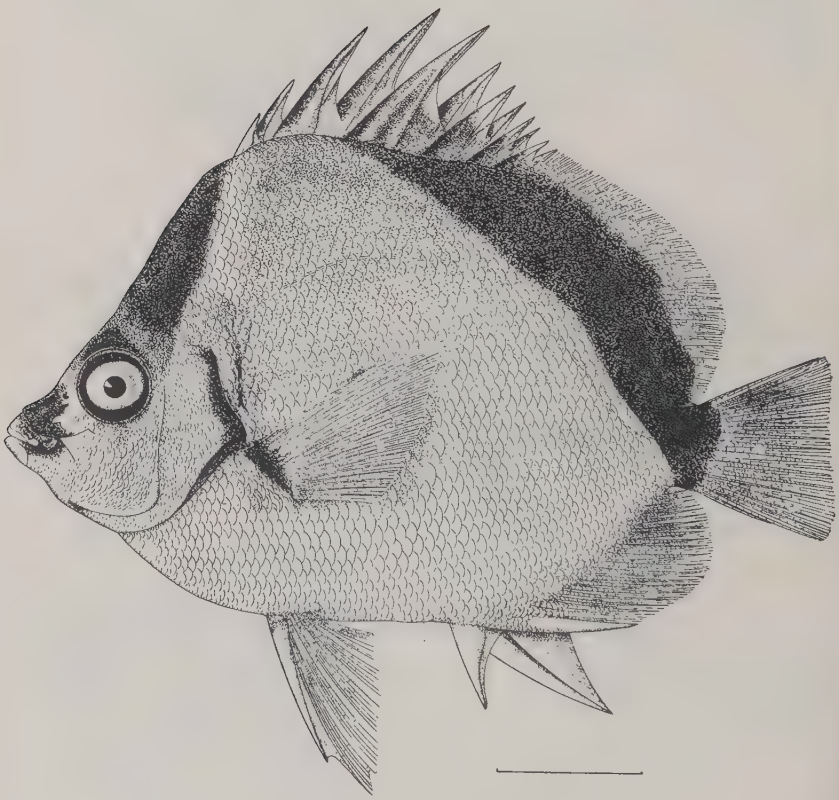
618

617. Pseudoscarus guacamaia. (P. 1657.)
618. Zenopsis ocellatus. (P. 1660.)



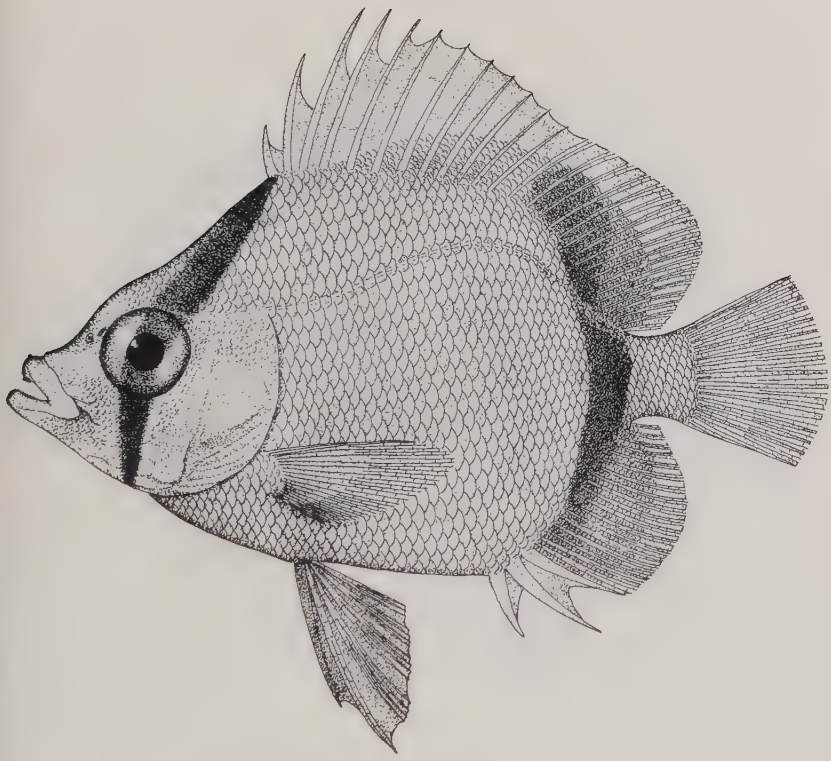
619

619. Chætodipterus faber. (P. 1668.)



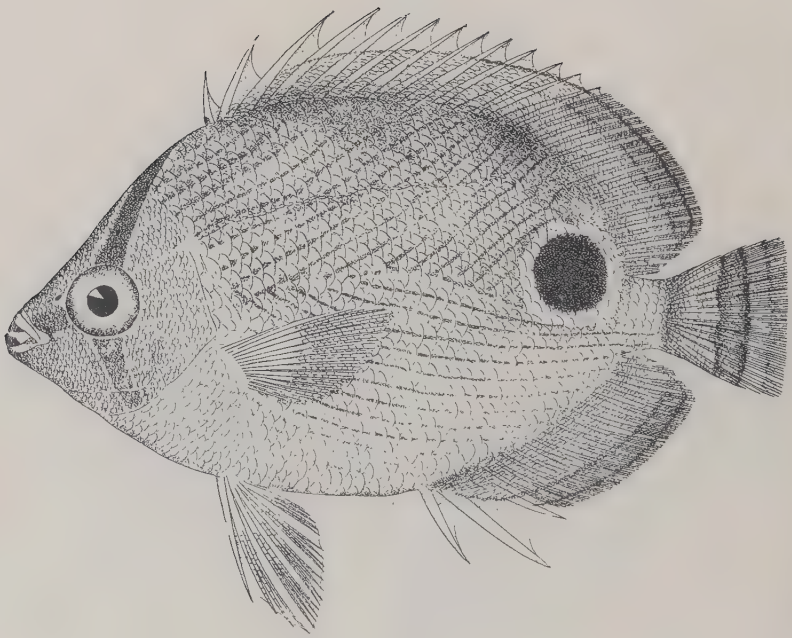
620

620. Chætodon nigrirostris. (P. 1673.)



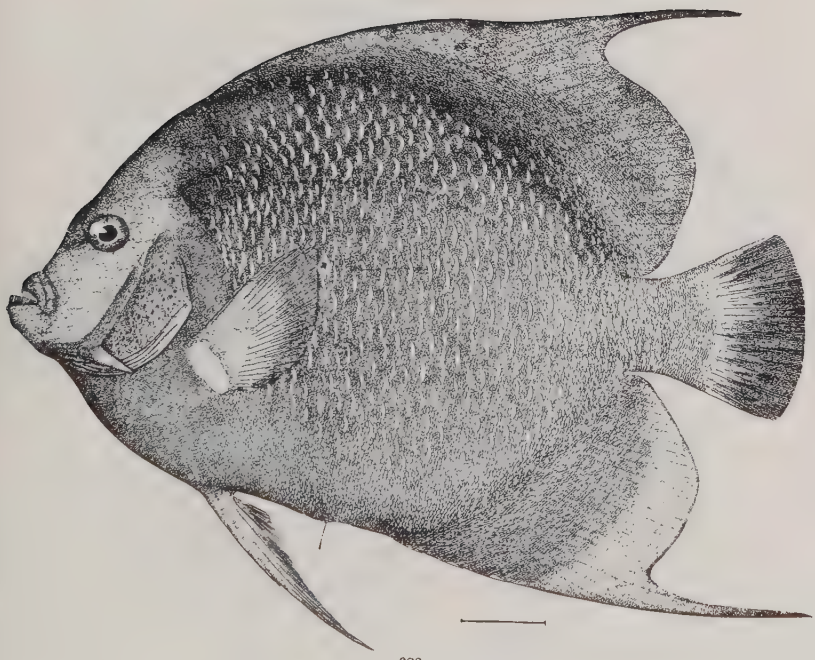
621

621. Chætodon ocellatus. (P. 1674.)



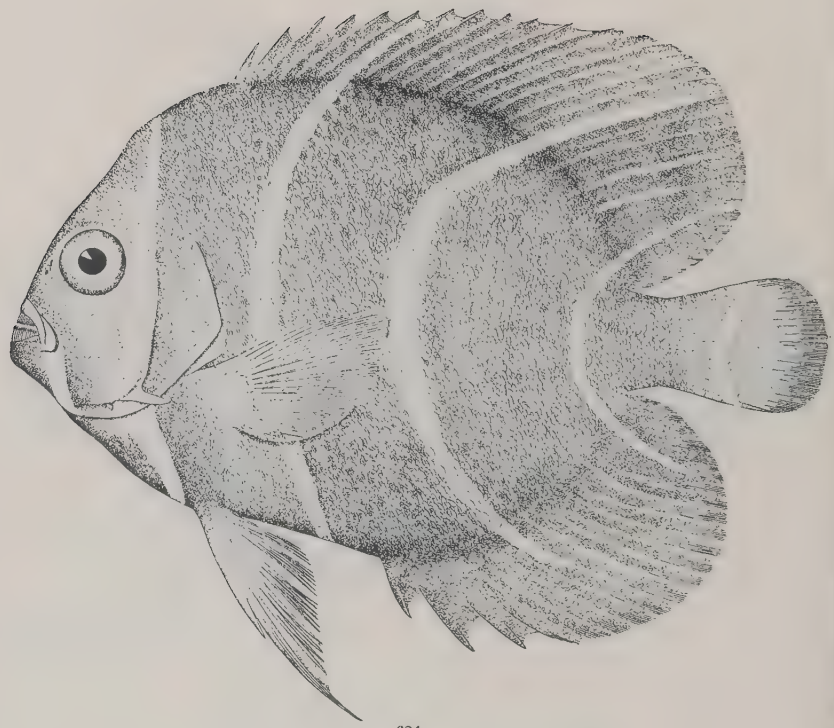
622

622. Chætodon capistratus. (P. 1677.)



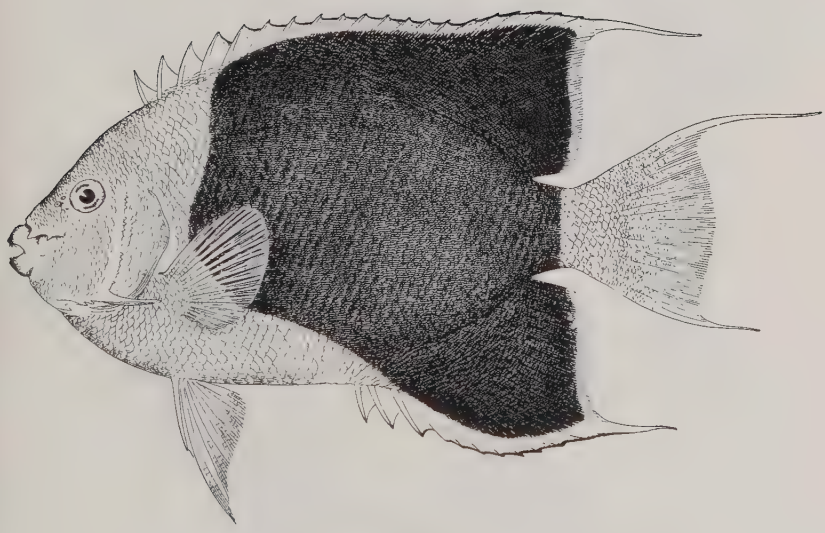
623

623. Pomacanthus arcuatus. (P. 1679.)



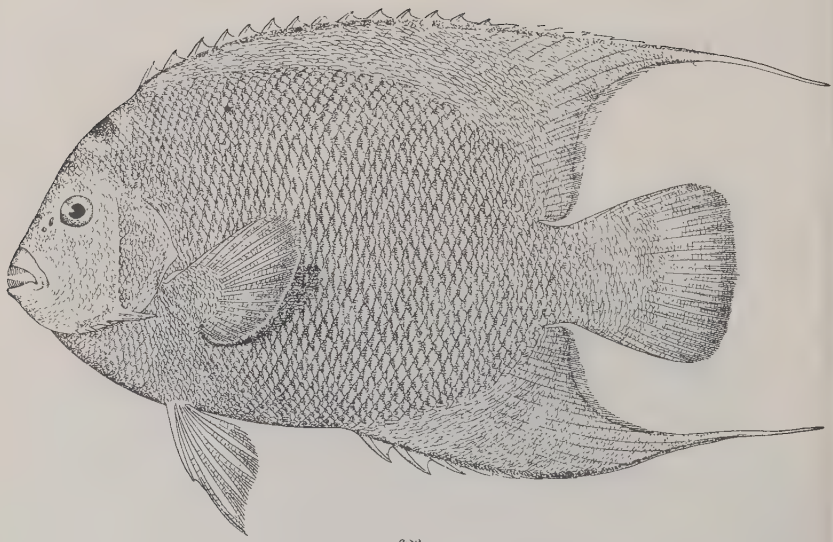
624

624. Pomacanthus zonipectus; young. (P. 1681.)

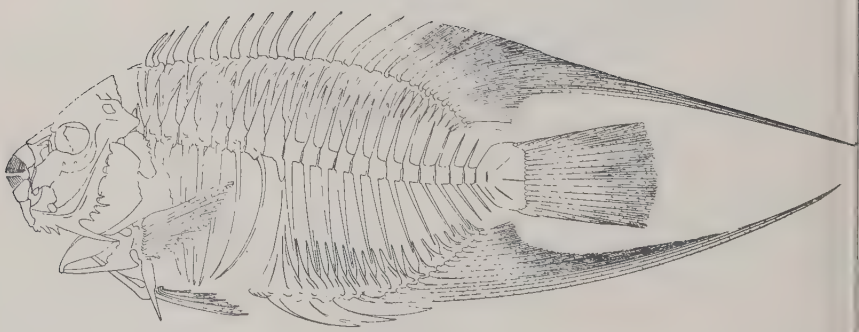


625

625. Holacanthus tricolor. (P. 1684.)

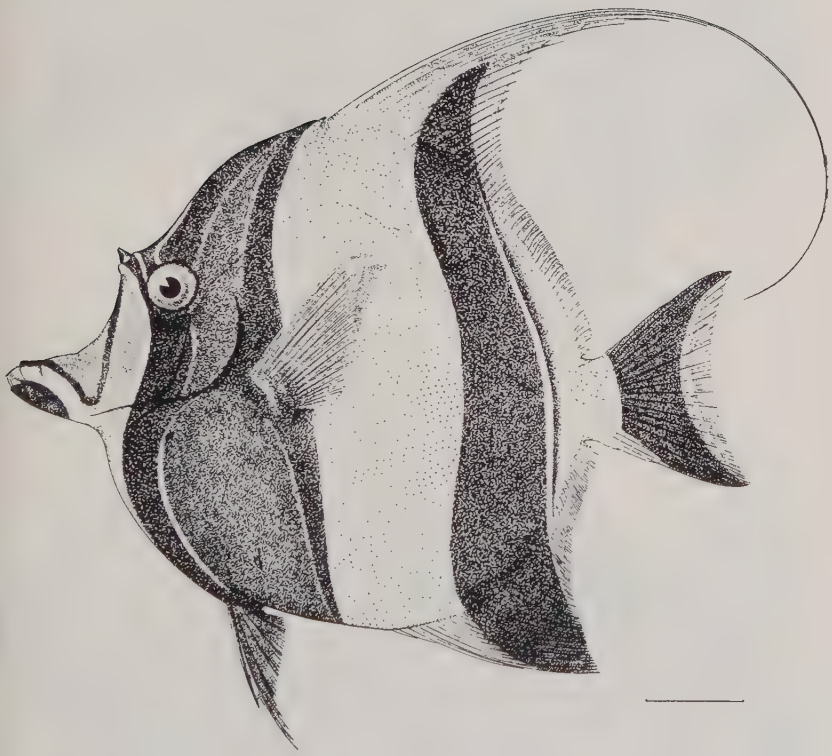


626



626*a*

626, 626*a*. ANGELICHTHYS CILIARIS. (P. 1684.)



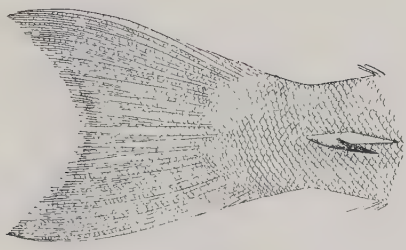
627

627. Zanclus cornutus. (P. 1687.)

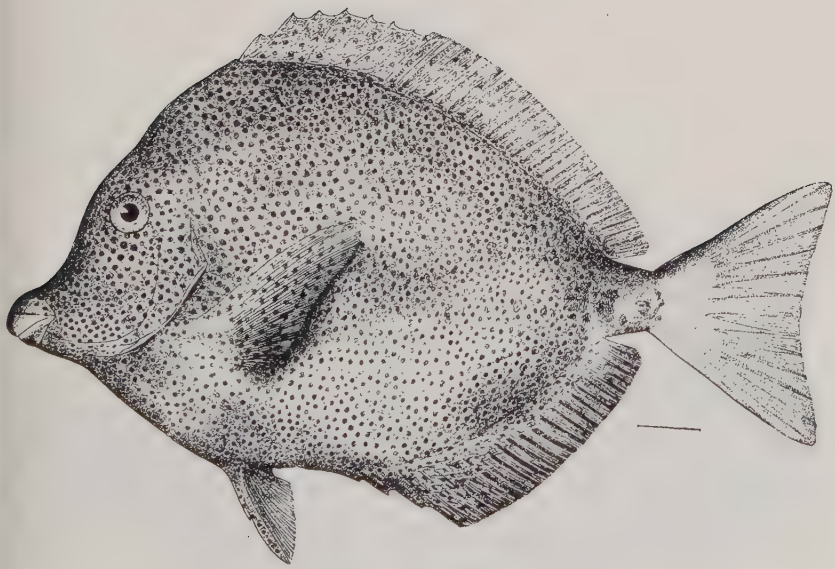
628

629

628. TEUTHIS CRESTONIS. (P. 1692.)
629. TEUTHIS BAHIANUS. (P. 1693.)

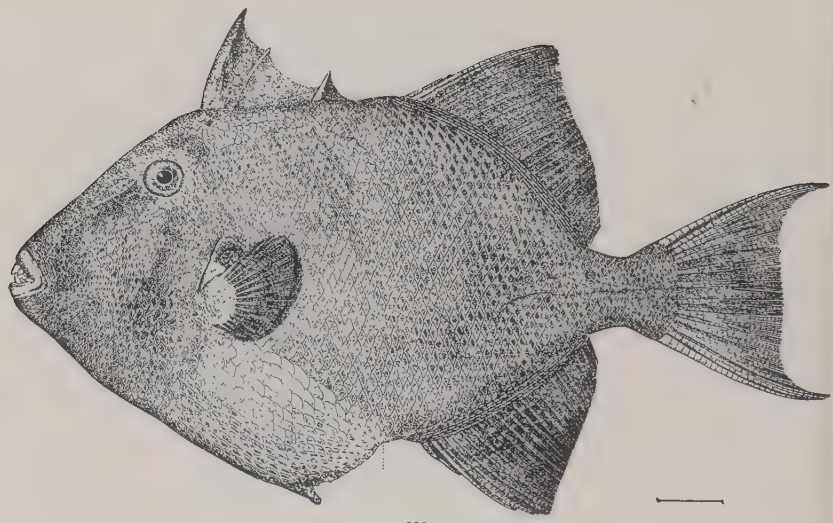


630



631

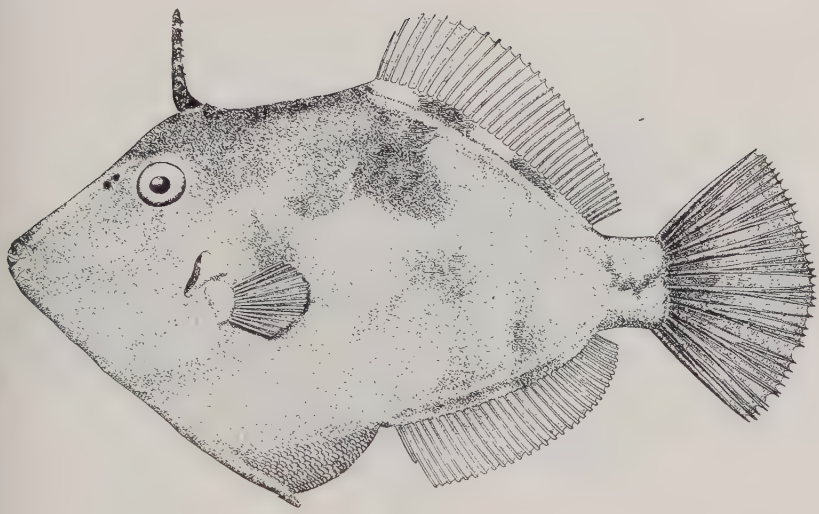
630. Tail of Teuthis bahianus. (P. 1693.)
631. Xesurus punctatus. (P. 1694.)



632

633

632. Balistes carolinensis. (P. 1701.)
633. Cantherines carolæ. (P. 1713.)



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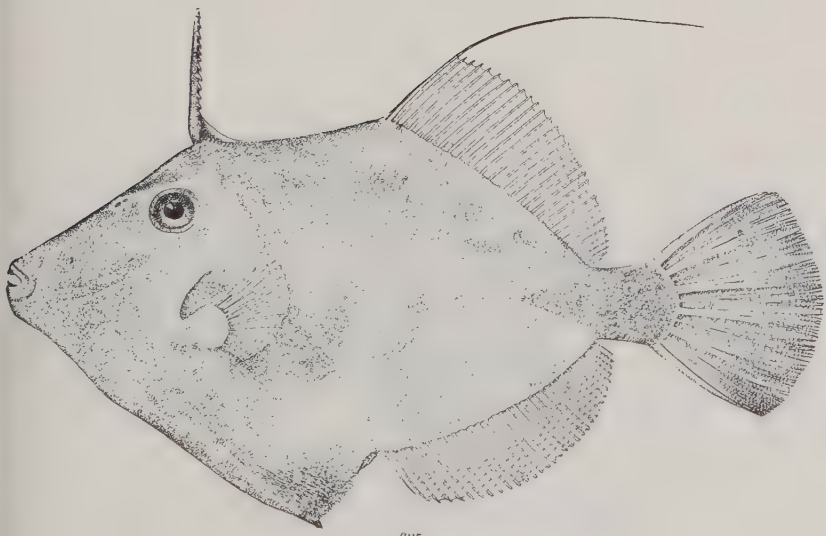


635

634. MONOCANTHUS CILIATUS. (P. 1714.)
635. MONOCANTHUS HISPIDUS. (P. 1715.)

636

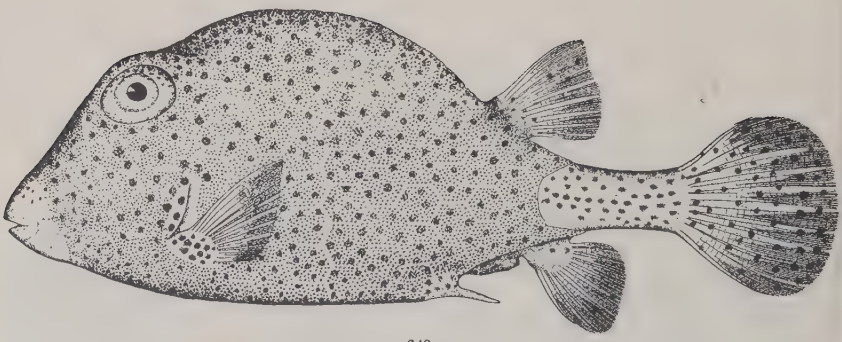
637

636. ALUTERA SCHŒPFII. (P. 1718.)
637. ALUTERA SCRIPTA. (P. 1719.)

638

639

638. LACTOPHRYS TRIQUETER. (P. 1722.)
639. LACTOPHRYS TRICORNIS. (P. 1724.)



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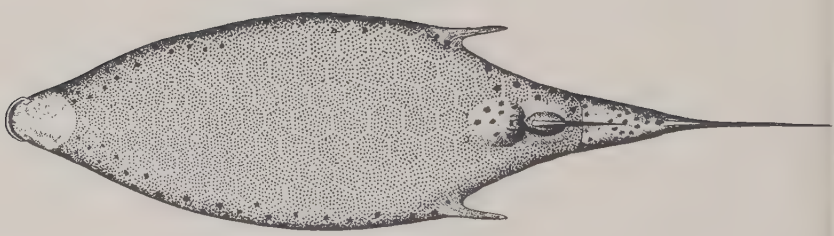
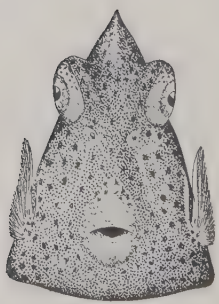
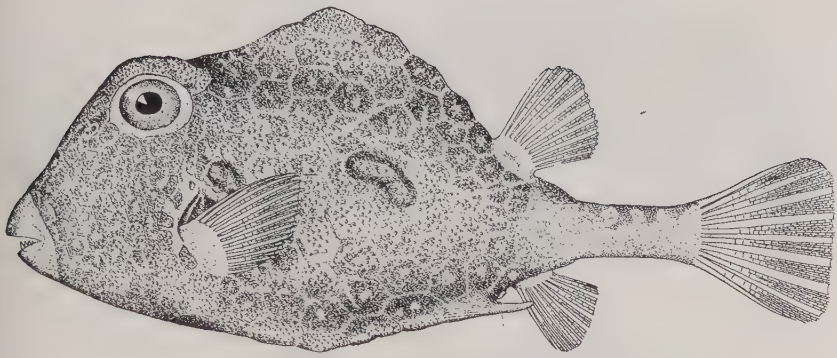


640*a*



640*b*

640, 640*a*, 640*b*. LACTOPHRYS BICAUDALIS. (P. 1723.)



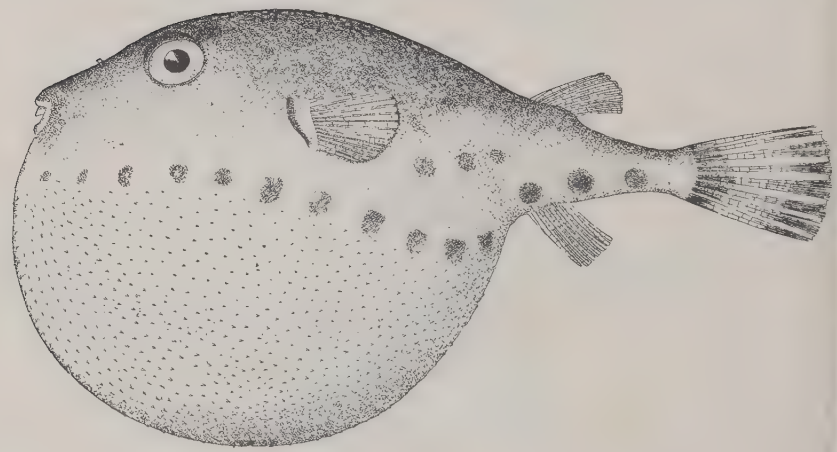
641

641*a*

642

641, 641*a*. LACTOPHRYS TRIGONUS. (P. 1723.)
642. LAGOCEPHALUS LÆVIGATUS. (P. 1728.)

643



644

645

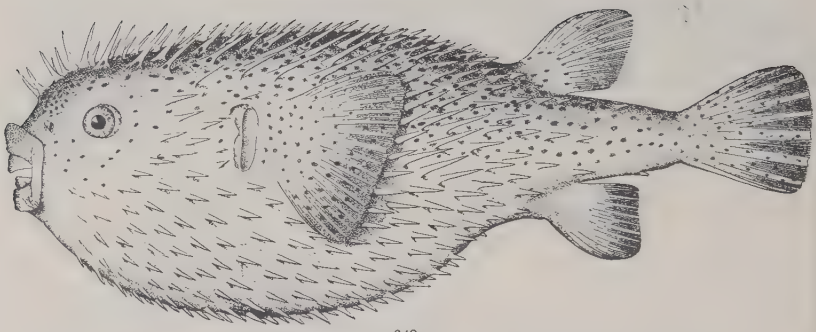
643. SPHEROIDES NEPHELUS. (P. 1732.)
644. SPHEROIDES SPENGLERI. (P. 1732.)
645. SPHEROIDES MACULATUS. (P. 1733.)

646

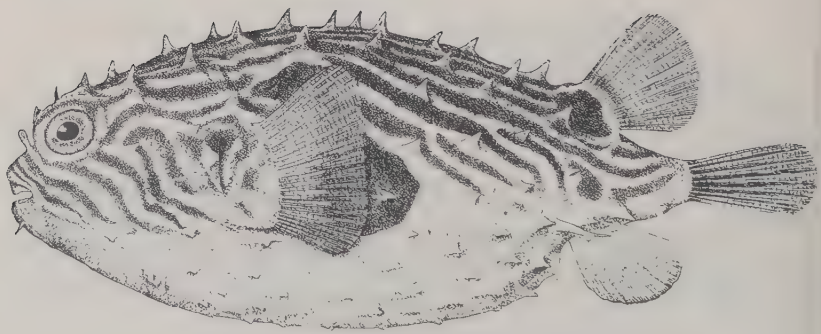
646*a*

647

646, 646*a*. SPHEROIDES TESTUDINEUS. (P. 1734.)
647. OVOIDES SETOSUS. (P. 1739.)

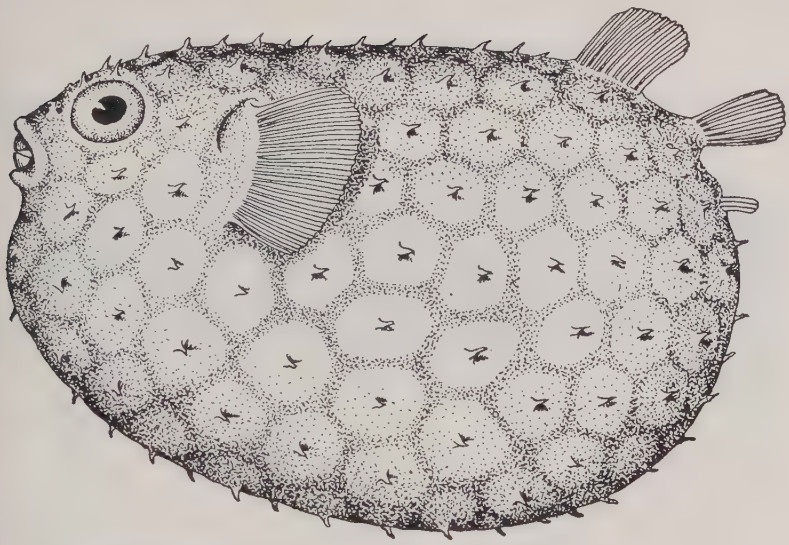


648



649

648. Diodon hystrix. (P. 1745.)
649. Chilomycterus schœpfi. (P. 1748.)



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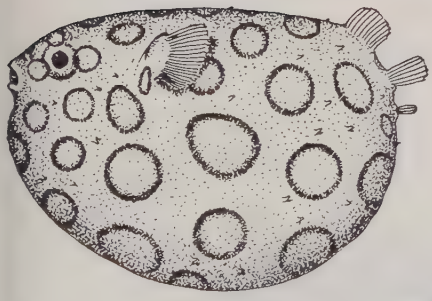
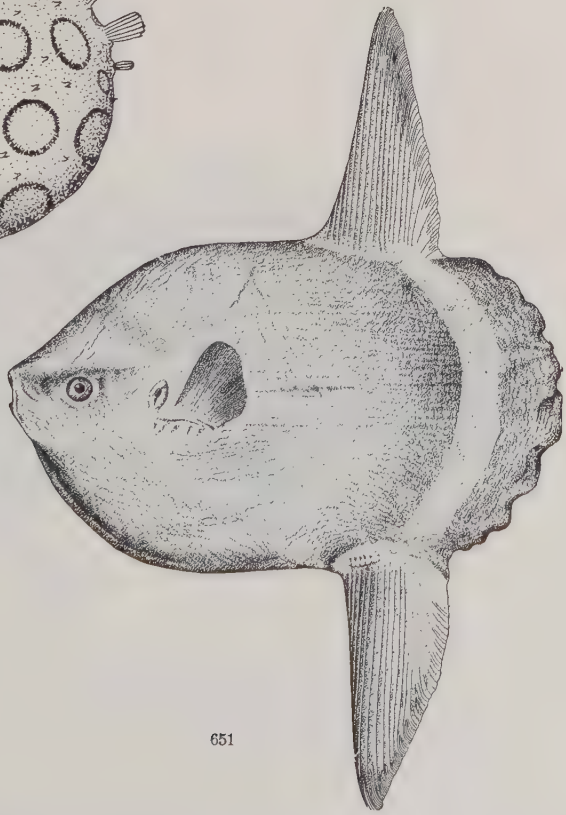


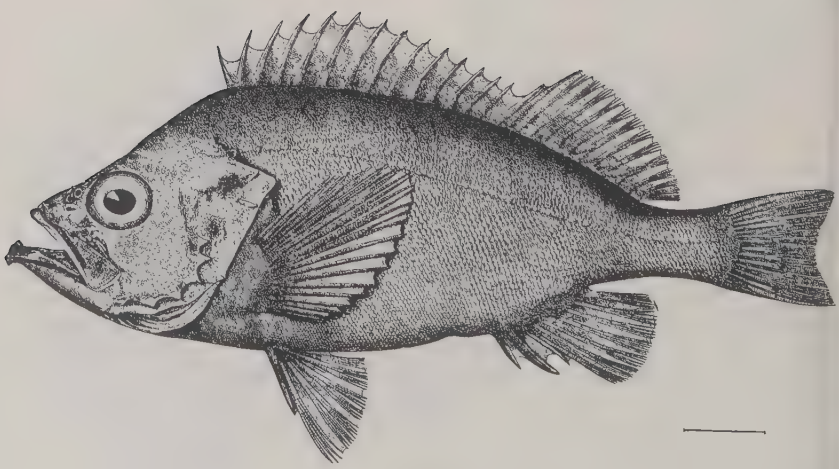
650*a*



651

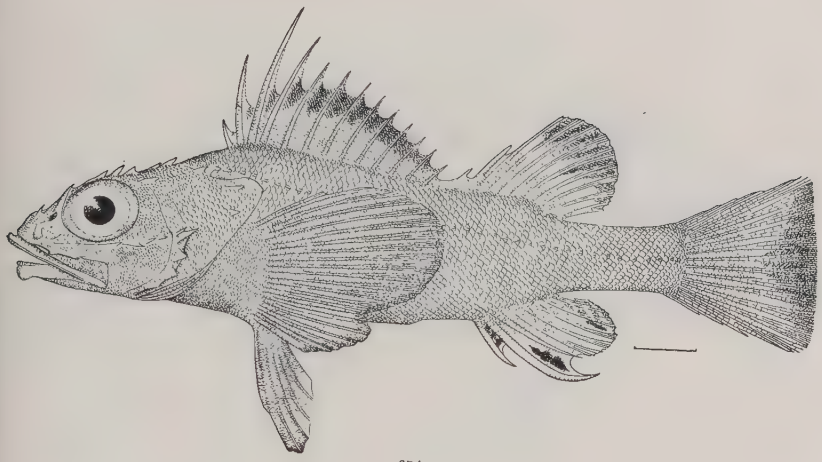
650. LYOSPHÆRA GLOBOSA. (P. 1751.)
650*a*. LYOSPHÆRA GLOBOSA; young. (P. 1751.)
651. MOLA MOLA. (P. 1753.)

652



653

652. Ranzania truncata. (P. 1755.)
653. Sebastes marinus. (P. 1760.)



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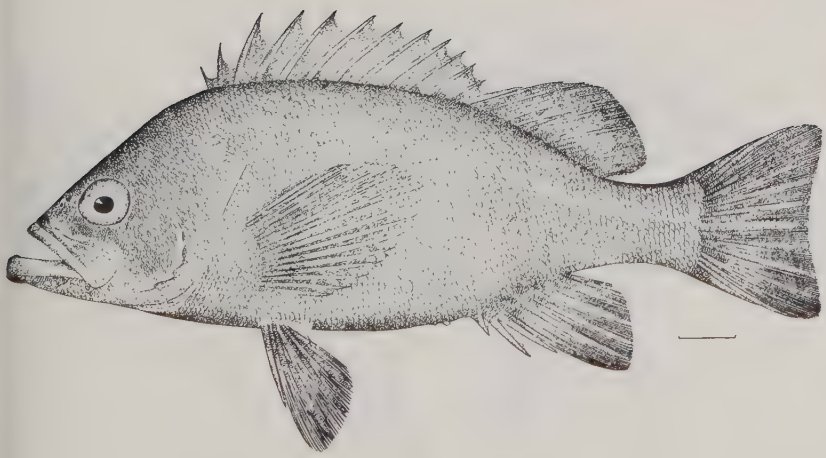
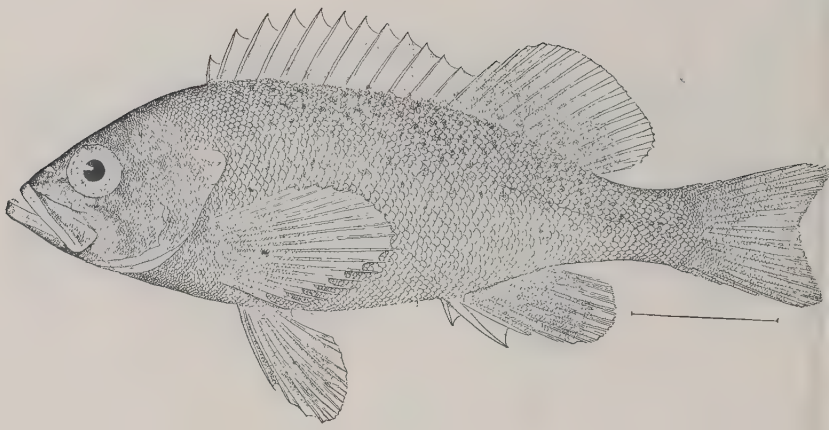
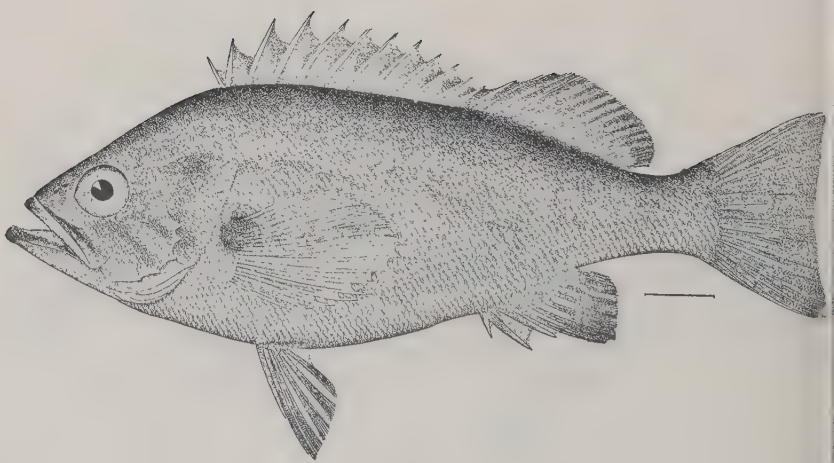


655

654. Sebastolobus altivelis. (P. 1763.)
655. Sebastodes melanops. (P. 1782.)

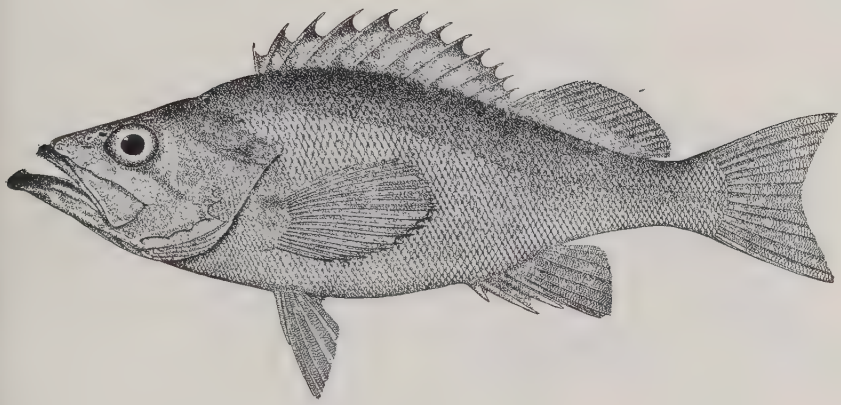


656

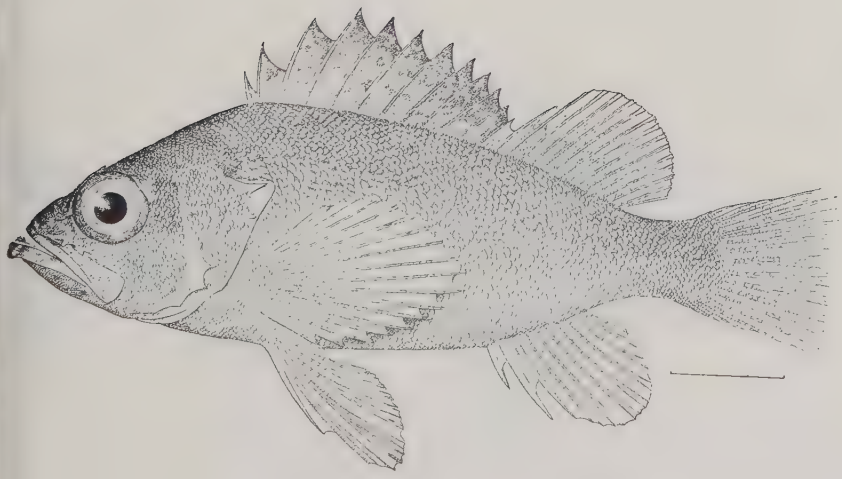


657

656. Sebastodes ciliatus. (P. 1783.)
657. Sebastodes mystinus. (P. 1784.)

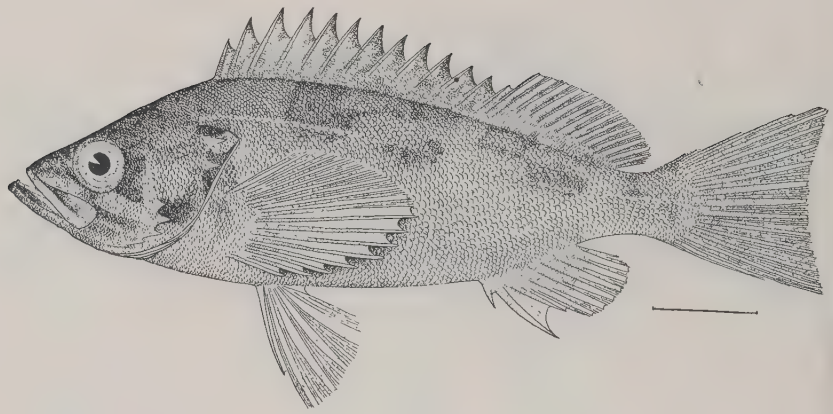


658

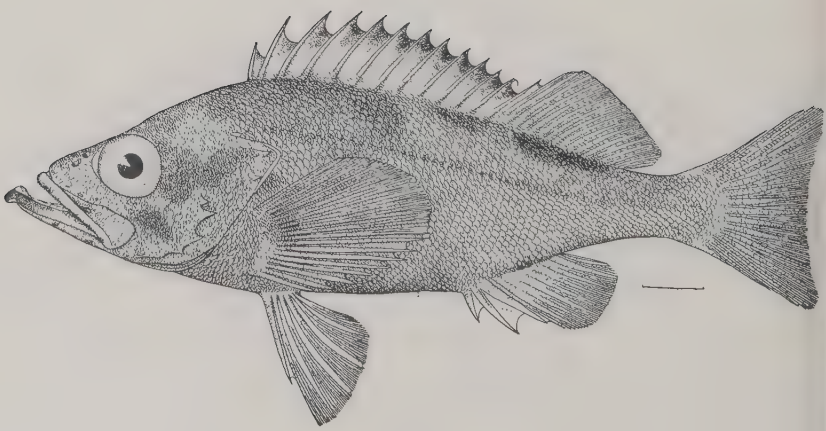


659

658. SEBASTODES BREVISPINIS. (P. 1787.)
659. SEBASTODES EIGENMANNI. (P. 1789.)



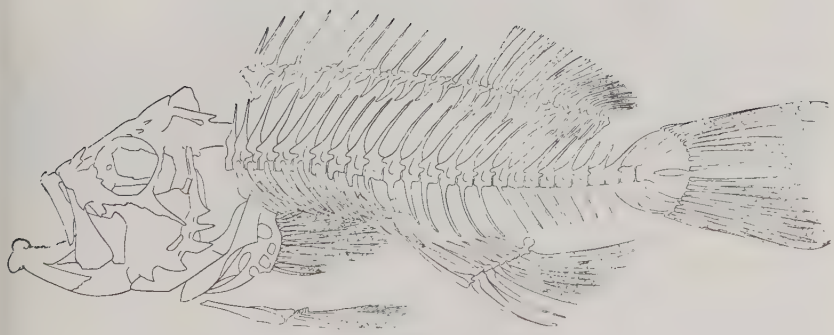
660



661

660. SEBASTODES HOPKINSI. (P. 1789.)
661. SEBASTODES ALUTUS. (P. 1790.)

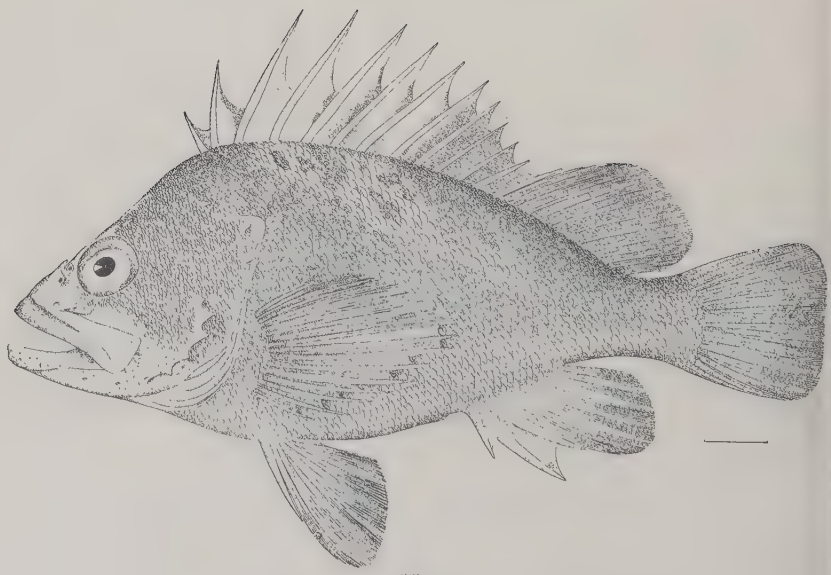
662



663

662. SEBASTODES PINNIGER. (P. 1793.)
663. SEBASTODES MINIATUS. (P. 1794.)

664



665

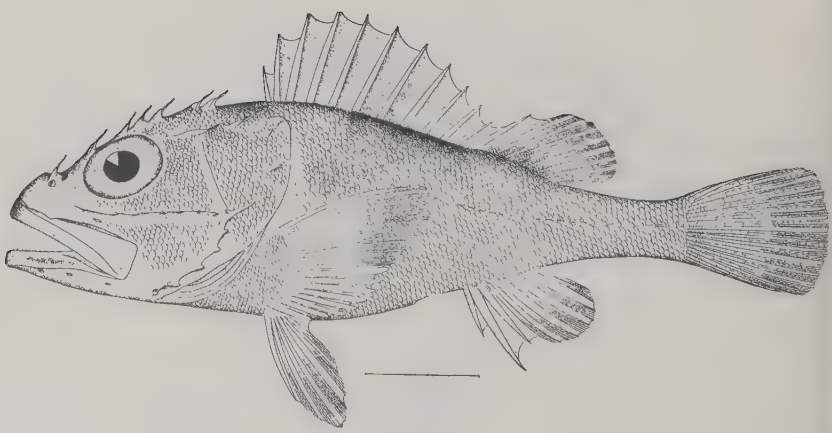
664. Sebastodes caurinus. (P. 1820.)
665. Sebastodes maliger. (P. 1822.)

666

667

666. Sebastodes gilberti. (P. 1823.)
667. Sebastodes serriceps. (P. 1827.)

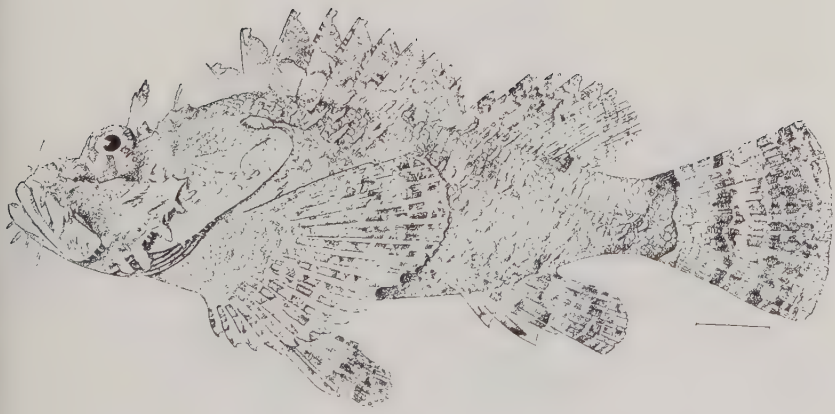
668



669

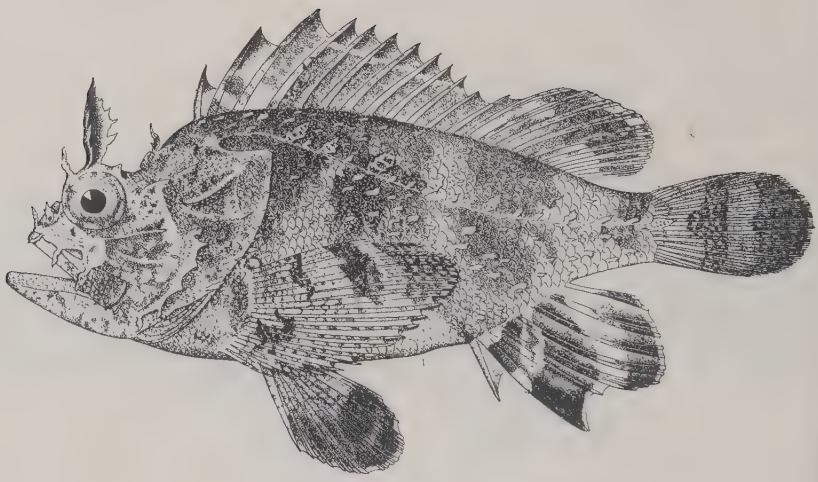
668. Sebastodes nigrocinctus. (P. 1827.)
669. Scorpæna cristulata. (P. 1841.)

670



671

670. SCORPÆNA BRASILIENSIS. (P. 1842.)
671. SCORPÆNA MYSTES. (P. 1849.)



672

673

672. Scorpæna grandicornis. (P. 1850.)
673. Pontinus macrolepis. (P. 1855.)

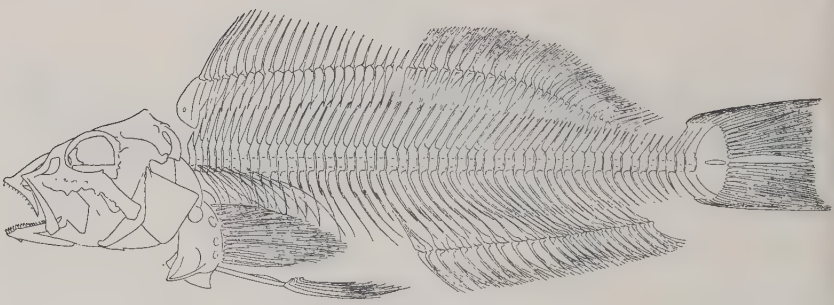
674

675

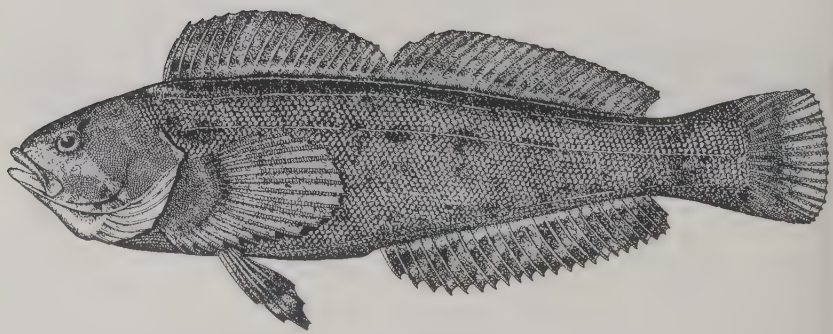
676

674. Setarches parmatus. (P. 1860.)
675. Anoplopoma fimbria. (P. 1862.)
676. Pleurogrammus monopterygius. (P. 1864.)

677



677*a*



678

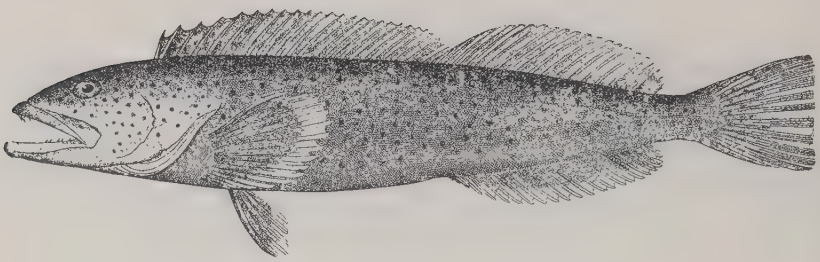
677, 677*a*. HEXAGRAMMOS DECAGRAMMUS. (P. 1867.)
678. HEXAGRAMMOS OCTOGRAMMUS. (P. 1869.)

679

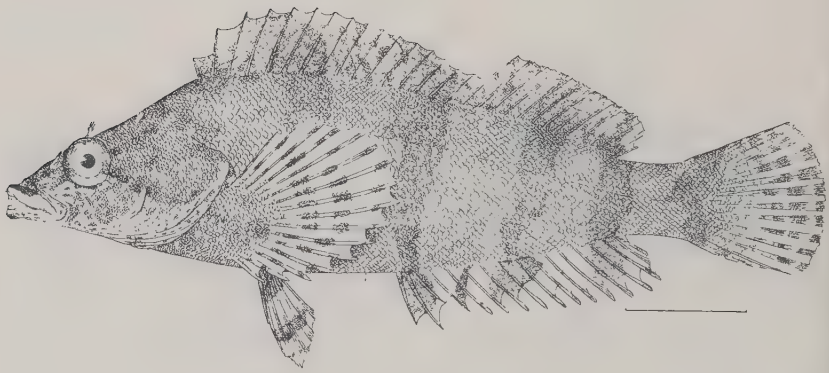
680

681

679. HEXAGRAMMOS STELLERI. (P. 1871.)
680. HEXAGRAMMOS SUPERCILIOSUS. (P. 1872.)
681. HEXAGRAMMOS OTAKII. (P. 1867.)



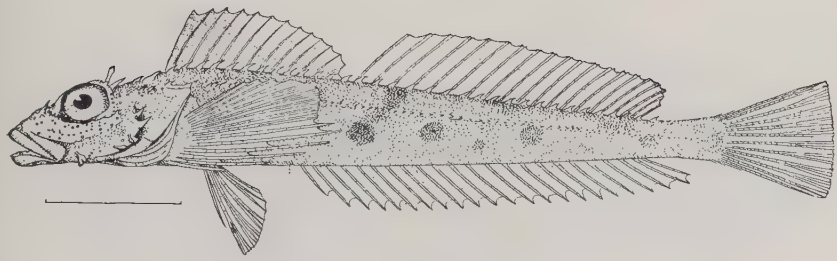
682



683

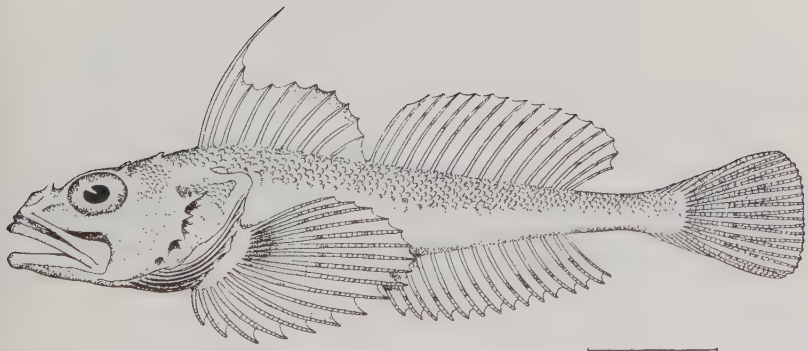
684

682. Ophidion elongatus. (P. 1875.)
683. Oxylebius pictus. (P. 1878.)
684. Jordania zonope. (P. 1884.)



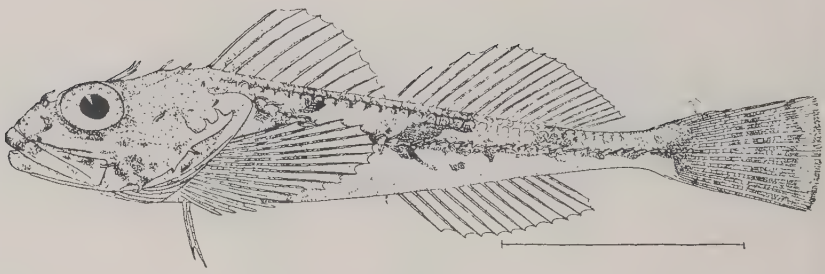
685

686

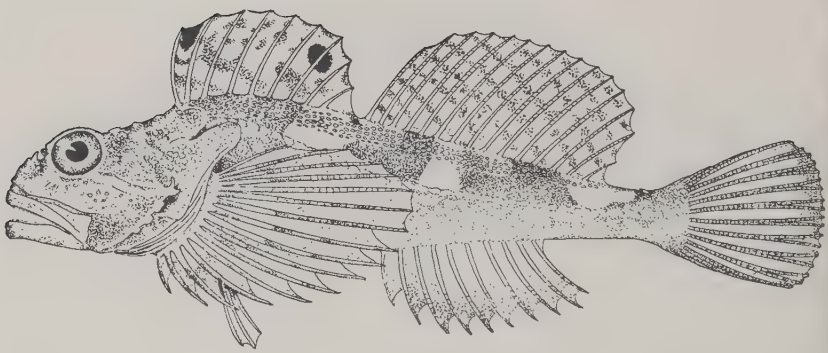


687

685. Alcidea thoburni. (P. 1887.)
686. Skull of Scorpænichthys marmoratus. (P. 1889.)
687. Chitonotus pugetensis. (P. 1890.)



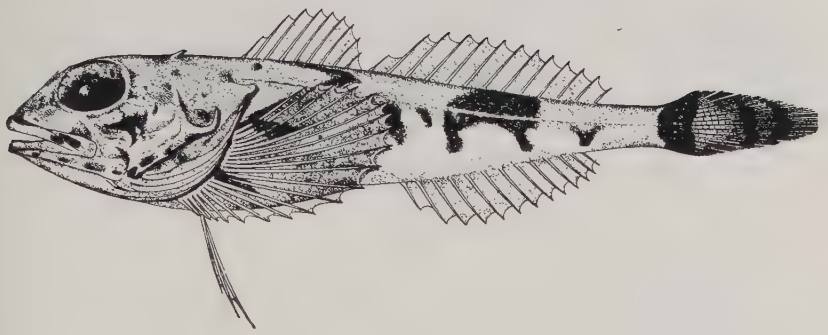
688



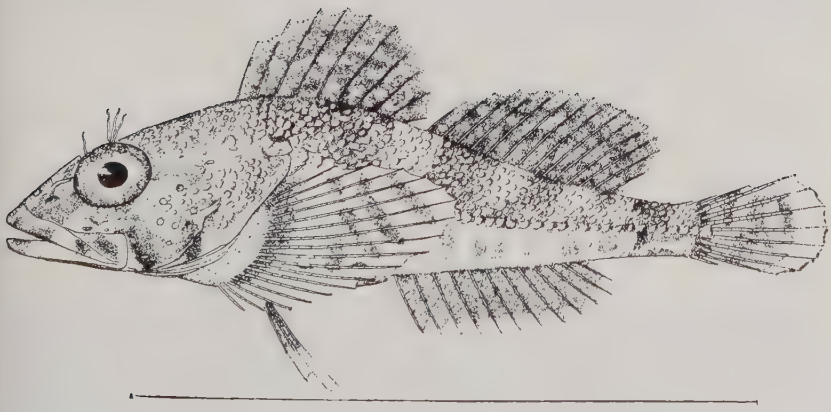
689

689*a*

688. ICELINUS BOREALIS. (P. 1896.)
689. ASTROLYTES NOTOSPILOTUS. (P. 1899.)
689*a*. ASTROLYTES NOTOSPILOTUS; young? (P. 1899.)



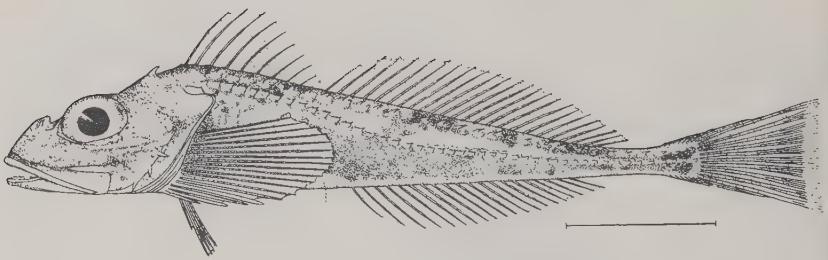
690



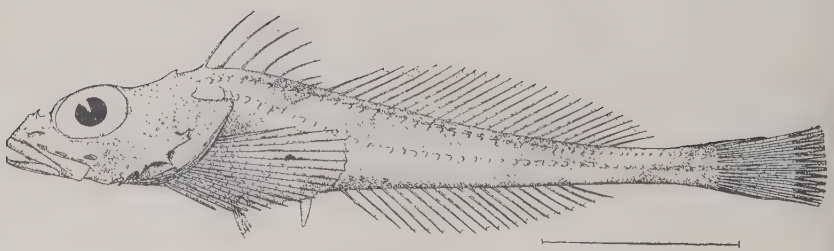
691

690. ARTEDIELLUS ATLANTICUS. (P. 1906.)
691. RUSCARIUS MEANYI. (P. 1908.)

692

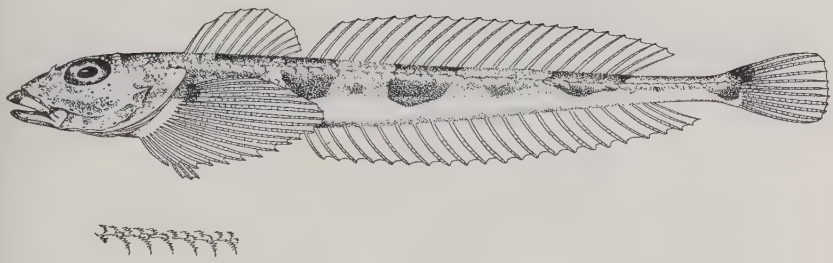


693

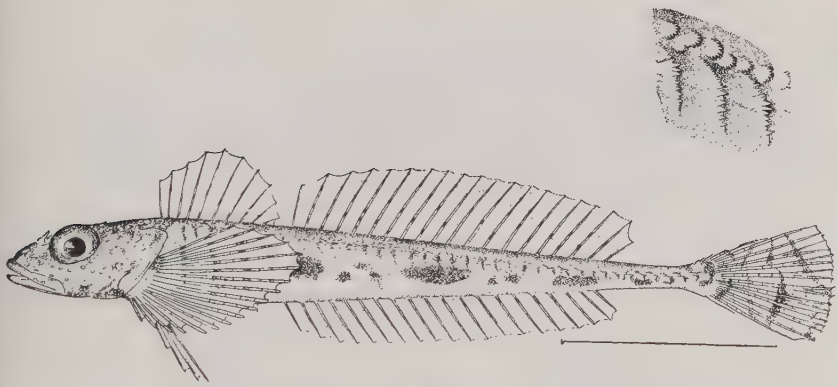


694

692. RASTRINUS SCUTIGER. (P. 1909.)
693. ICELUS SPINIGER. (P. 1914.)
694. ICELUS CANALICULATUS. (P. 1917.)



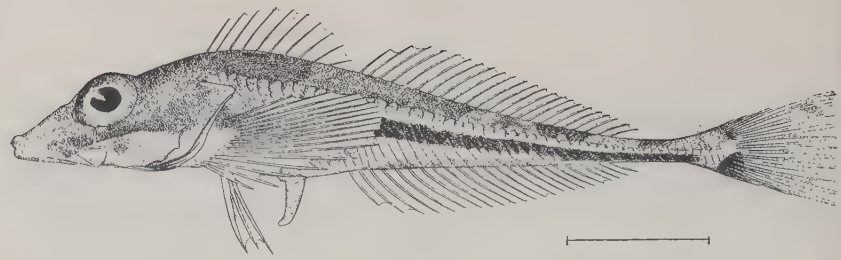
695



696

697

695. RADULINUS BOLEOIDES. (P. 1919.)
696. RADULINUS ASPRELLUS. (P. 1920.)
697. TRIGLOPS PINGELI. (P. 1923.)



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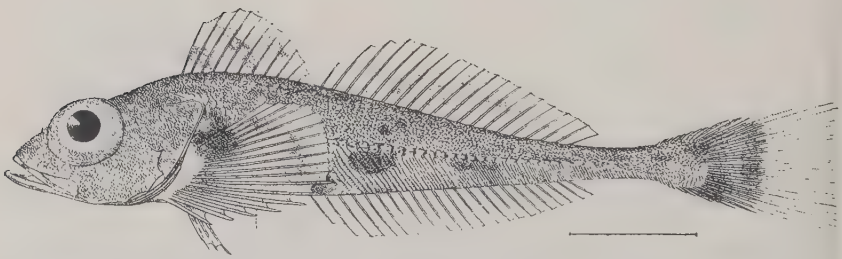
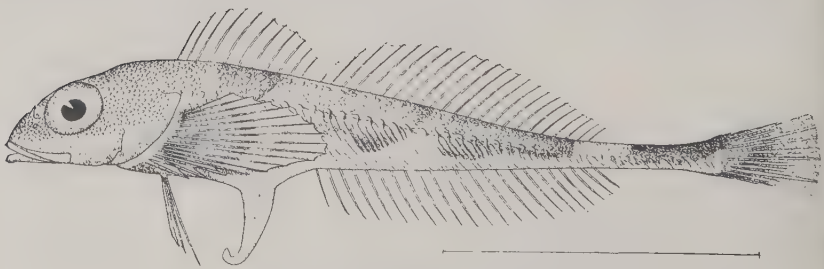
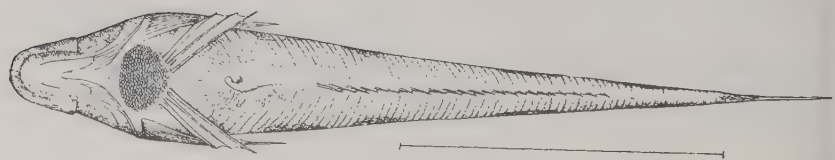


699

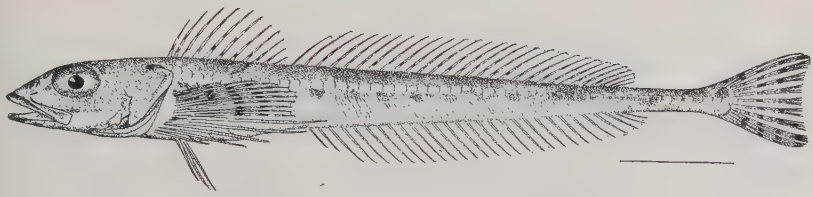


700

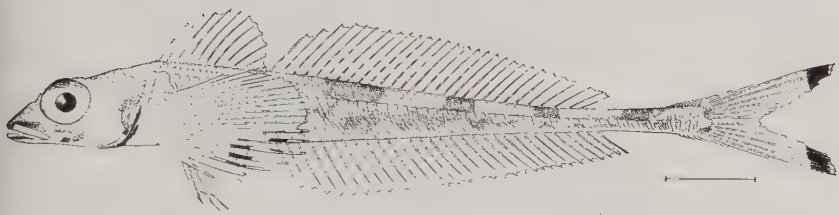


700*a*

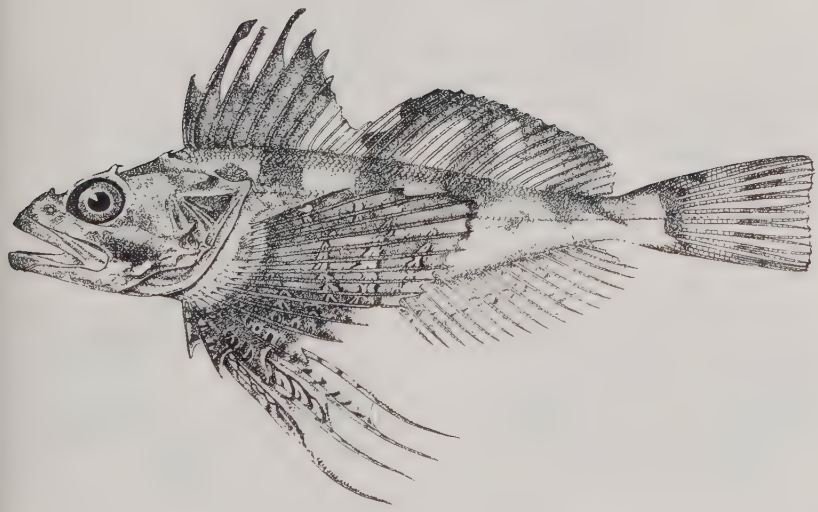
698. TRIGLOPS BEANI. (P. 1924.)
699. TRIGLOPS SCEPTICUS. (P. 1925.)
700, 700*a*. STERNIAS XENOSTETHUS. (P. 1927.)



701



702

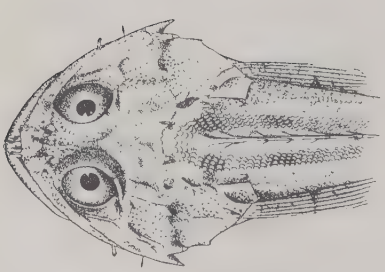


703

701. PRIONISTIUS MACELLUS. (P. 1928.)
702. ELANURA FORFICATA. (P. 1930.)
703. MELLETES PAPILIO. (P. 1932.)

704

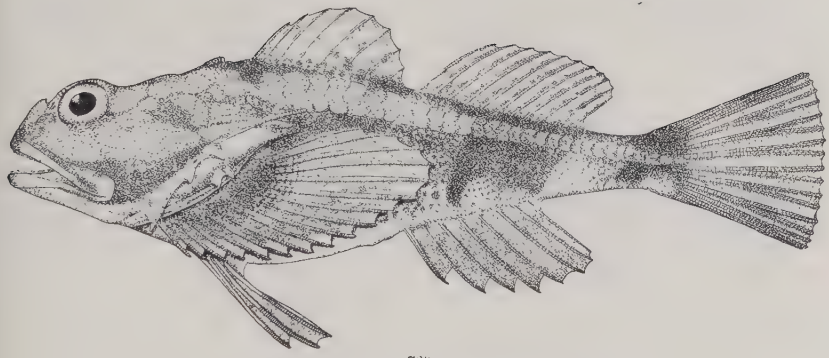
705



705*a*

705*b*

704. HEMILEPIDOTUS JORDANI. (P. 1934.)
705, 705*a*, 705*b*. HEMILEPIDOTUS HEMILEPIDOTUS. (P. 1935.)



706

707

706. ENOPHRYS BISON. (P. 1938.)
707. CERATOCOTTUS DICERAUS. (P. 1940.)

708

709

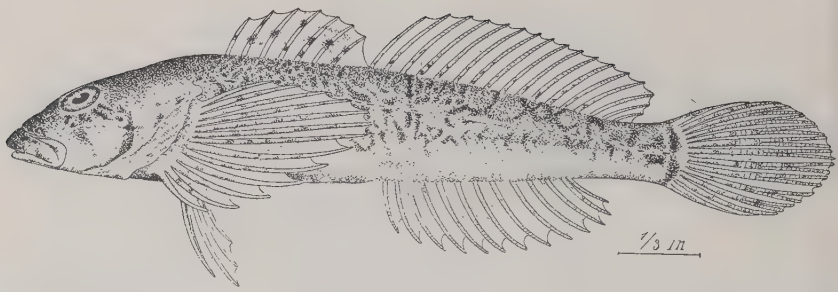
708. COTTUS EVERMANNI. (P. 1945.)
709. COTTUS PUNCTULATUS. (P. 1948.)

710

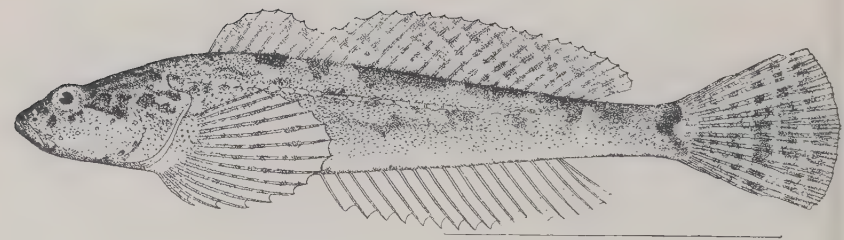
711

712

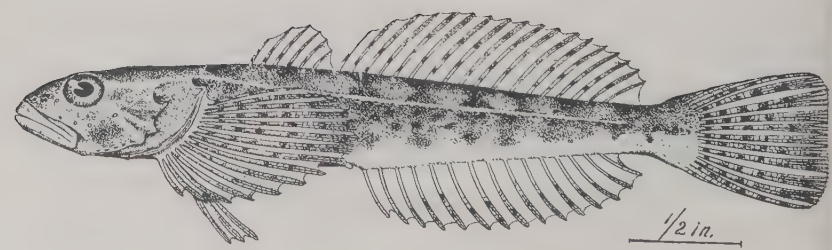
710. COTTUS PERPLEXUS. (P. 1955.)
711. COTTUS KLAMATHENSIS. (P. 1955.)
712. COTTUS ALEUTICUS. (P. 1957.)



713

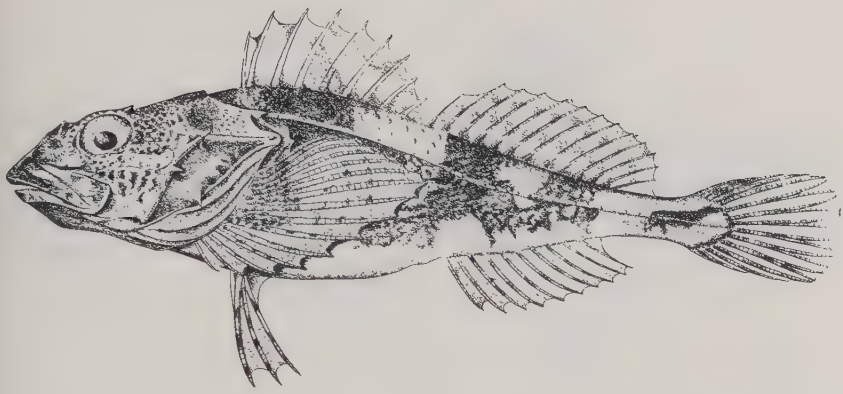


714



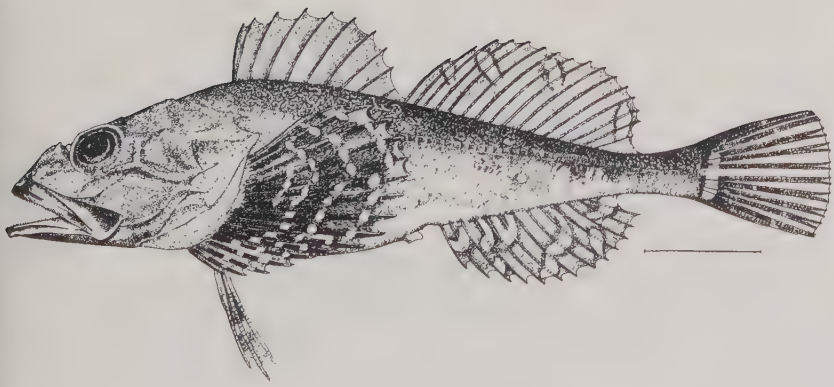
715

713. COTTUS LEIOPOMUS. (P. 1962.)
714. COTTUS PRINCEPS. (P. 1962.)
715. URANIDEA TENUIS. (P. 1966.)



716

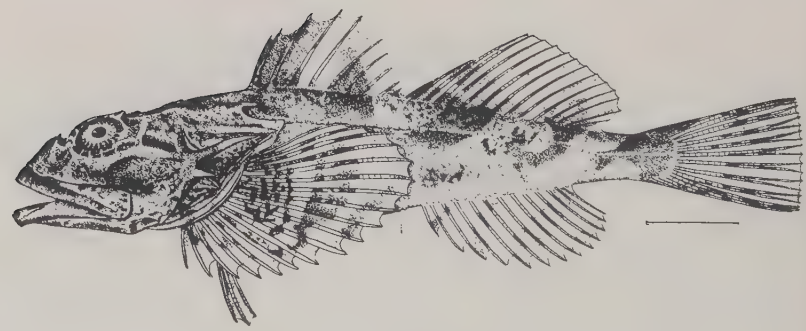
716*a*



717

716, 716*a*. MYOXOCEPHALUS ÆNEUS. (P. 1972.)
717. MYOXOCEPHALUS SCORPIUS. (P. 1974.)

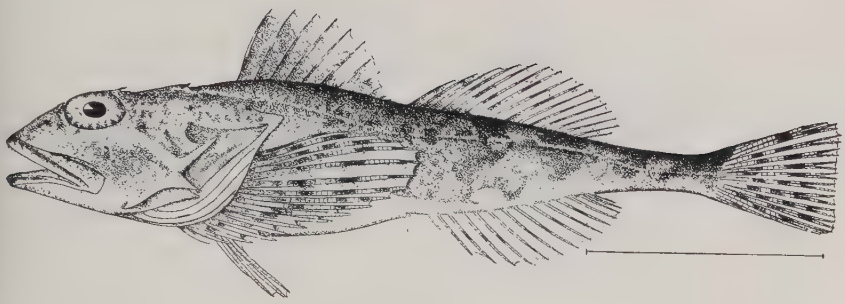
718



719

720

718. MYOXOCEPHALUS OCTODECIMSPINOSUS. (P. 1976.)
719. MYOXOCEPHALUS POLYACANTHOCEPHALUS. (P. 1976.)
720. MYOXOCEPHALUS JAOK. (P. 1977.)



721

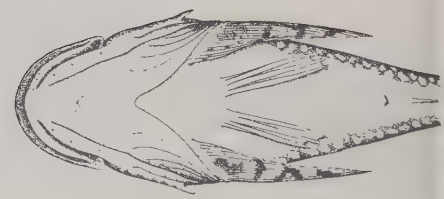
721a

722

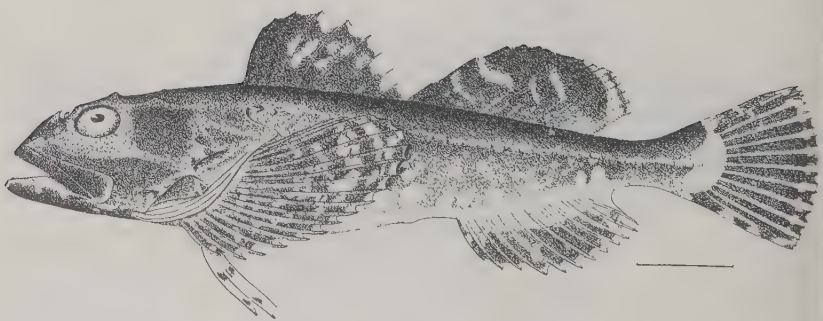
721, 721a. MYOXOCEPHALUS VERRUCOSUS. (P. 1979.)
722. MYOXOCEPHALUS AXILLARIS. (P. 1980.)

723

723a



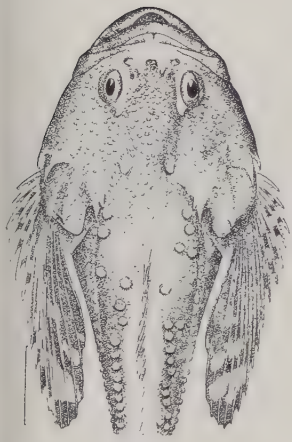
723b



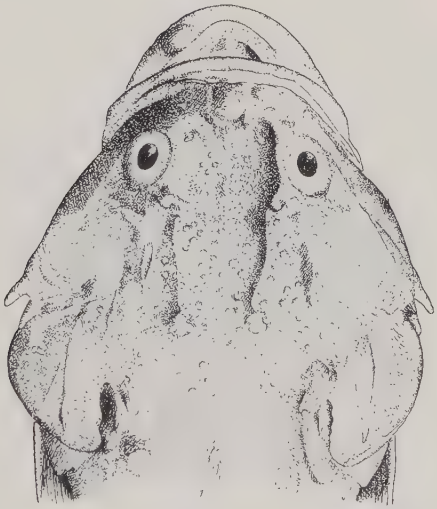
724

723, 723*a*, 723*b*. MYOXOCEPHALUS STELLERI. (P. 1981.)
724. MYOXOCEPHALUS NIGER. (P. 1985.)

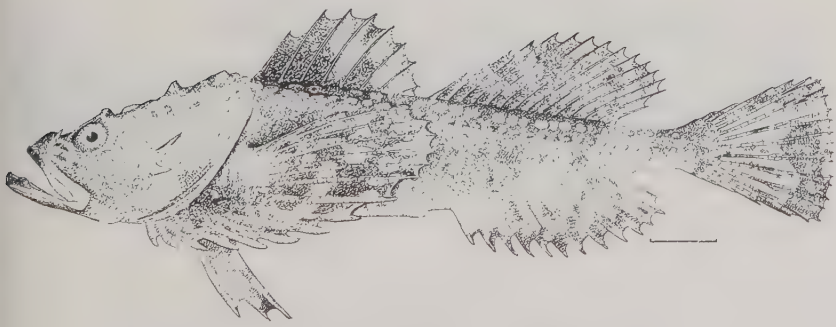
725



725a

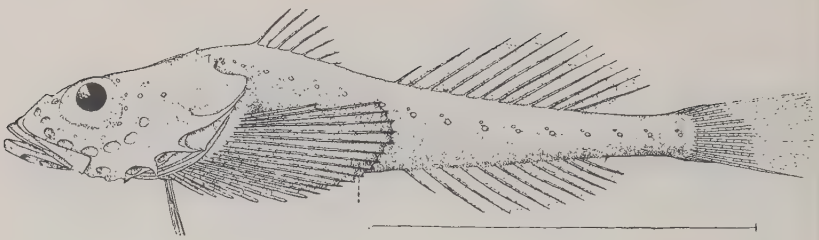


726a



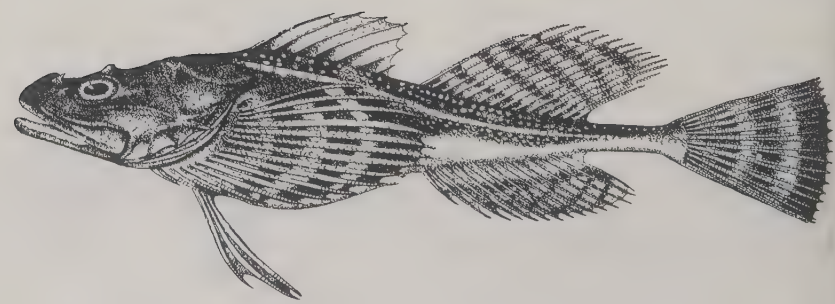
726

725, 725*a*. MEGALOCOTTUS PLATYCEPHALUS. (P. 1987.)
726, 726*a*. MEGALOCOTTUS LATICEPS. (P. 1988.)



727

728



729

727. Zesticelus profundorum. (P. 1990.)
728. Dasycottus setiger. (P. 1991.)
729. Oncocottus quadricornis. (P. 2001.)

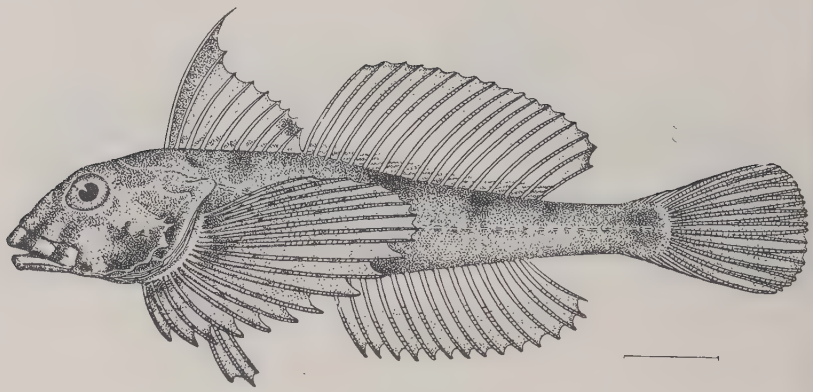
730

730*a*

730*b*

731

730, 730*a*, 730*b*. GYMNOCANTHUS PISTILLIGER. (P. 2006.)
731. GYMNOCANTHUS GALEATUS. (P. 2010.)



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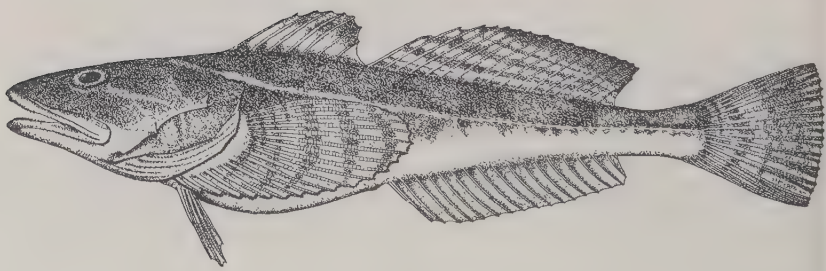
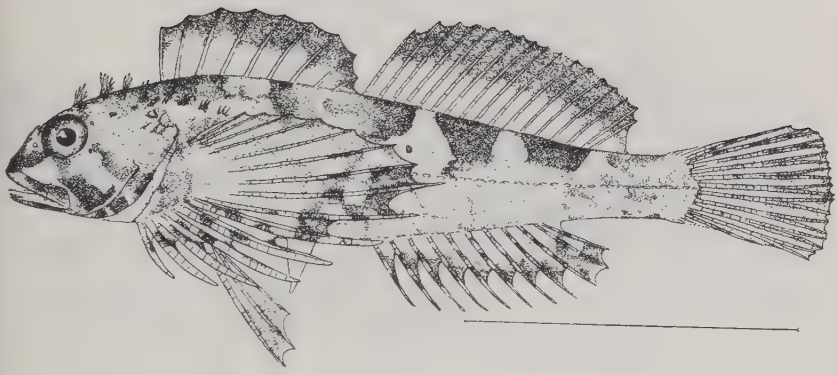


733

734

732. Leiocottus hirundo. (P. 2011.)
733. Leptocottus armatus. (P. 2012.)
734. Oligocottus maculosus. (P. 2013.)

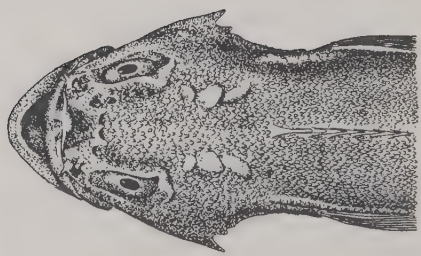


735

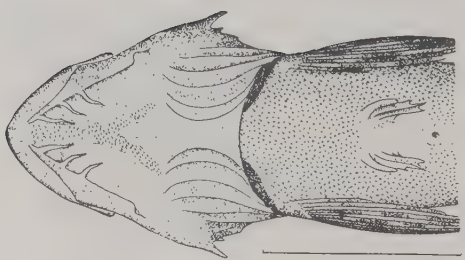
736

735. Blennicottus embryum. (Pp. 2016, 2864.)
736. Histiocottus bilobus. (P. 2018.)

737



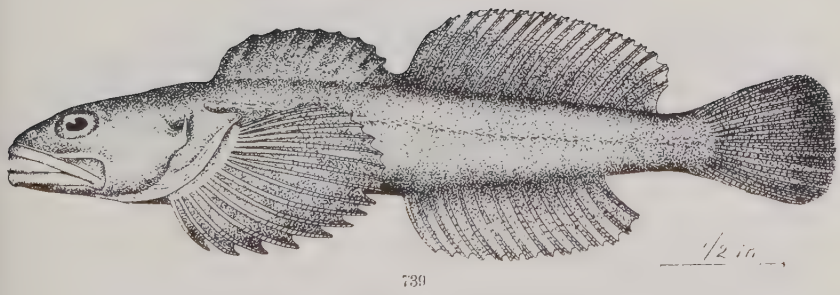
737*a*



737*b*

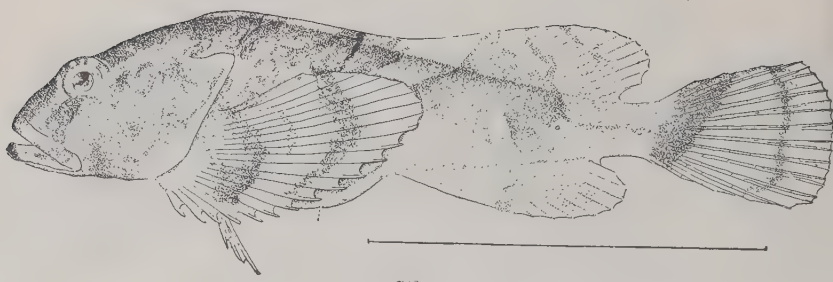
737, 737*a*, 737*b*. Blepsias cirrhosus. (P. 2018.)

738



739

738. Hemitripterus americanus. (P. 2023.)
739. Ascelichthys rhodorus. (P. 2025.)

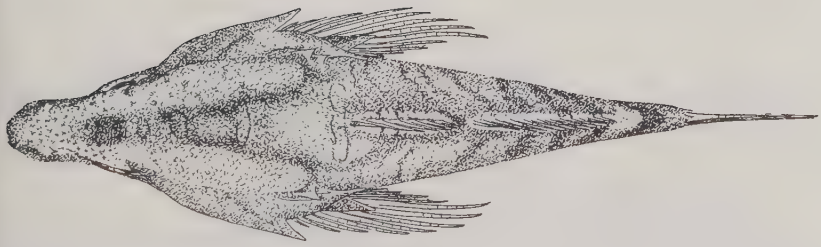


740

741

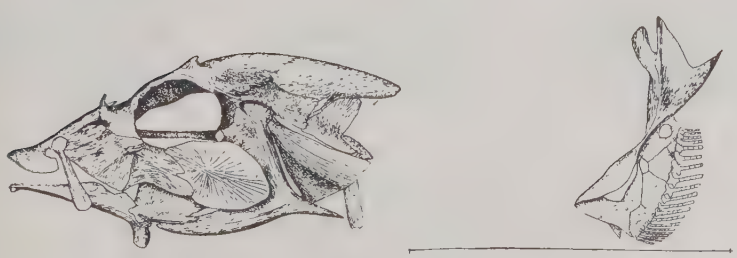
740. Psychrolutes paradoxus. (P. 2026.)
741. Gilbertidia sigolutes. (P. 2028.)

742



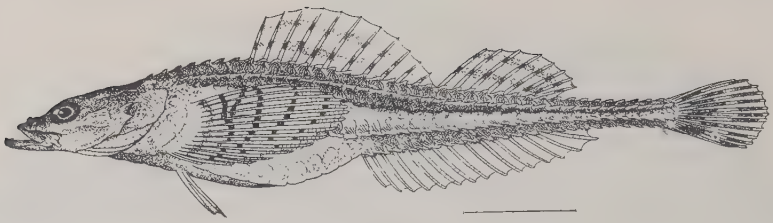
742*a*

742*b*



742*c*

742; 742*a*, 742*b*, 742*c*. RHAMPHOCOTTUS RICHARDSONI. (P. 2030.)



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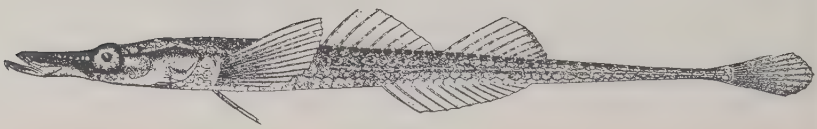
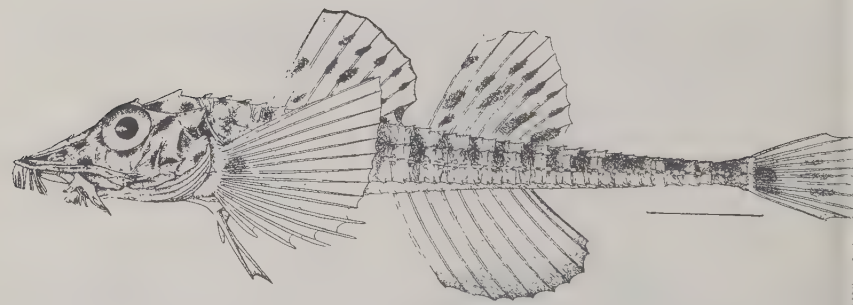
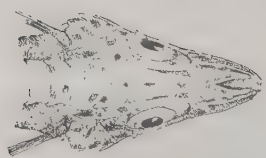


744

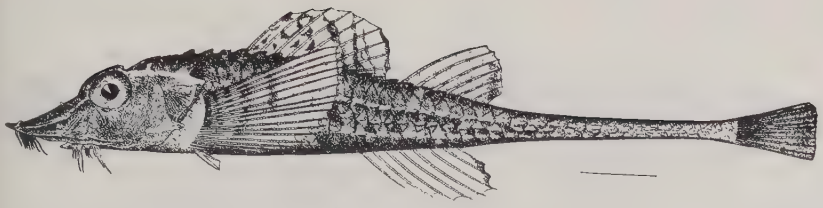


745

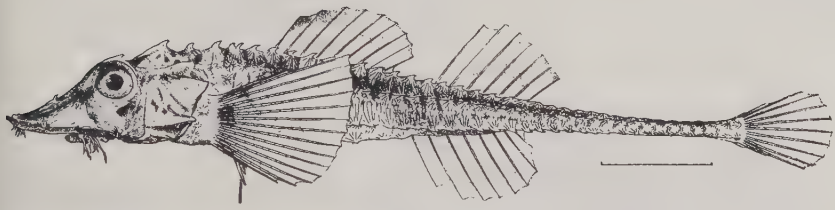


745*a*

743. Occa dodecaedron. (P. 2044.)
744. Pallasina barbata. (P. 2049.)
745, 745*a*. Podothecus accipiter. (P. 2055.)



746



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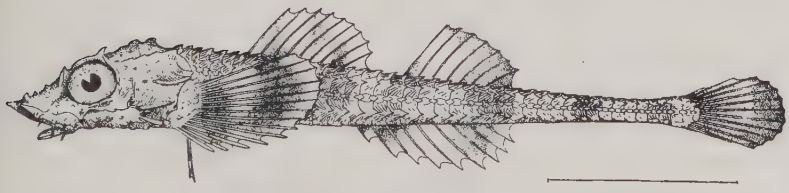
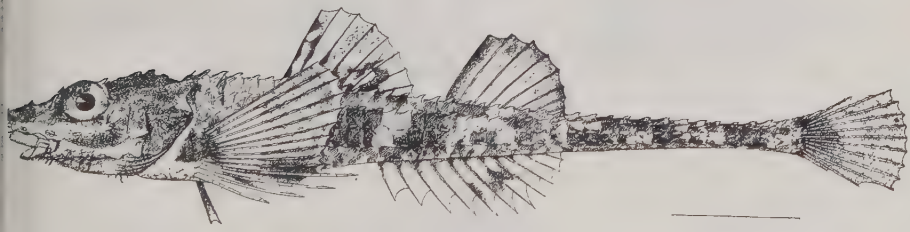


748



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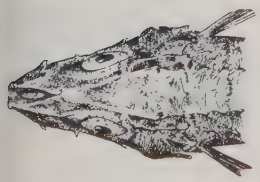
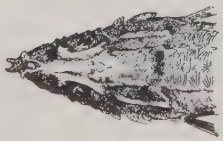
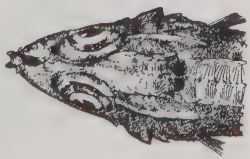


747*a*

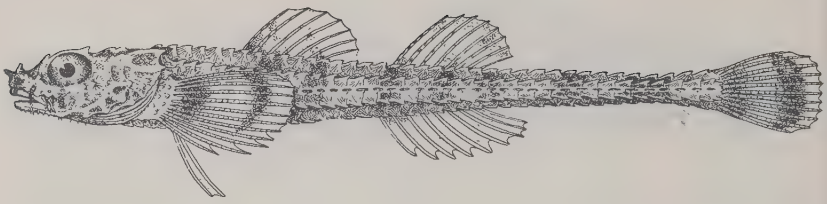


748*a*



749*a*

746. PODOTHECUS ACIPENSERINUS. (P. 2061.)
747, 747*a*. PODOTHECUS VETERNUS. (P. 2063.)
748, 748*a*. STELGIS VULSUS. (P. 2067.)
749, 749*a*. AVERRUNCUS EMMELANE. (P. 2069.)



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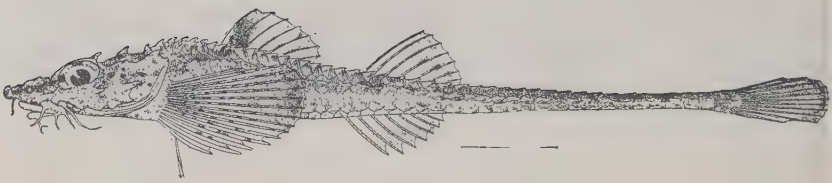
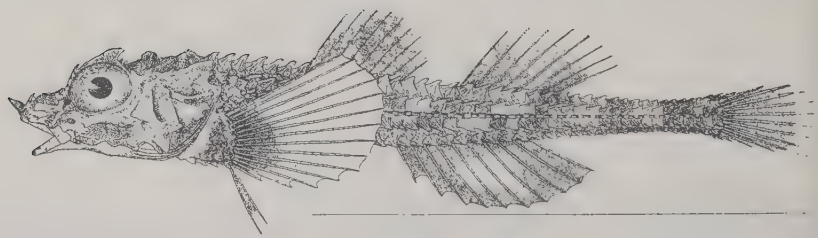
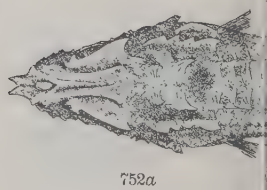


751



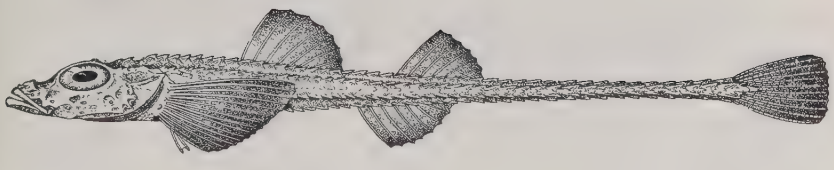
752

750*a*



752*a*

750, 750*a*. AVERRUNCUS STERLETUS. (P. 2071.)
751. SARRITOR FRENATUS. (P. 2073.)
752, 752*a*. XYSTES AXINOPHRYS. (P. 2076.)

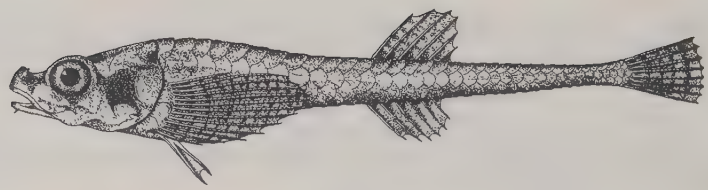


753

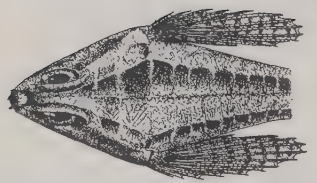
754

754*a*

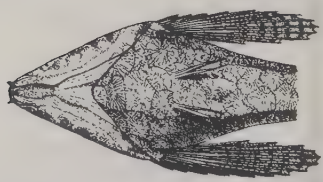
753. Bathyagonus nigripinnis. (P. 2078.)
754, 754*a*. Xenochirus triacanthus. (P. 2084.)



755



755*a*

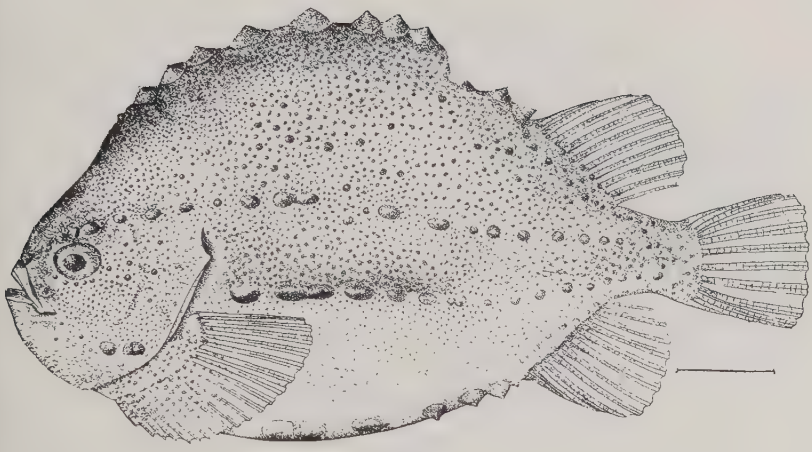


755*b*

756

756*a*

755, 755*a*, 755*b*. ASPIDOPHOROIDES GUNTHERI. (P. 2090.)
756, 756*a*. ASPIDOPHOROIDES MONOPTERYGIUS. (P. 2091.)



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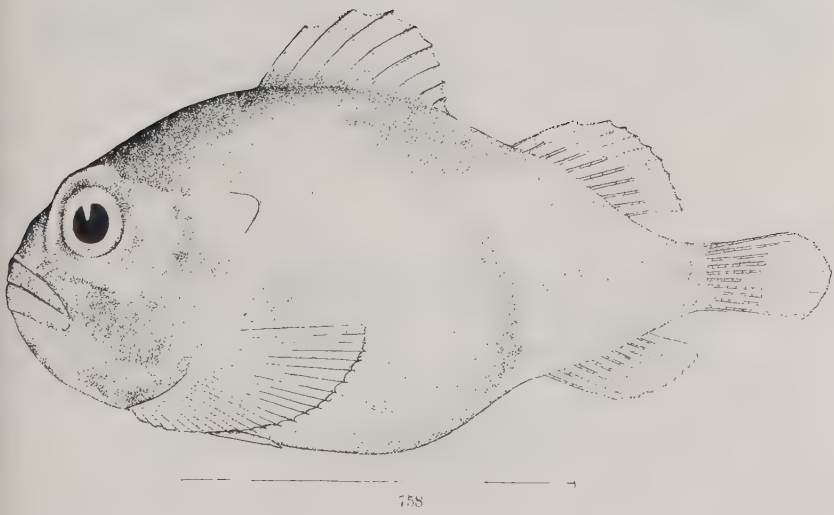
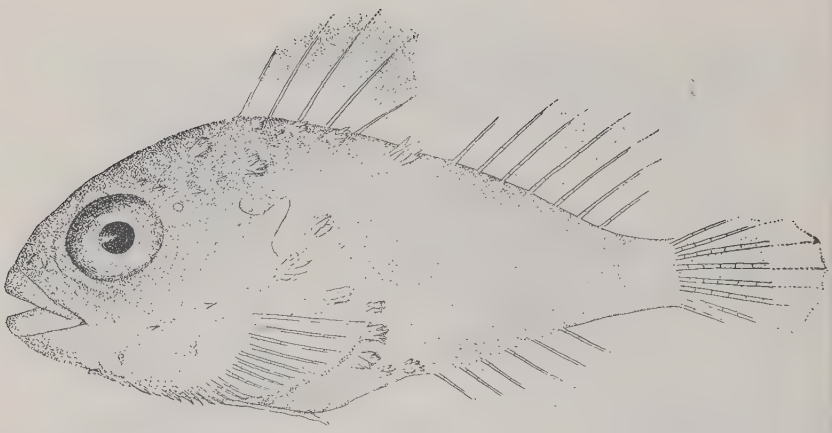


758

757. Cyclopterus lumpus. (P. 2096.)
758. Lethotremus muticus. (P. 2101.)



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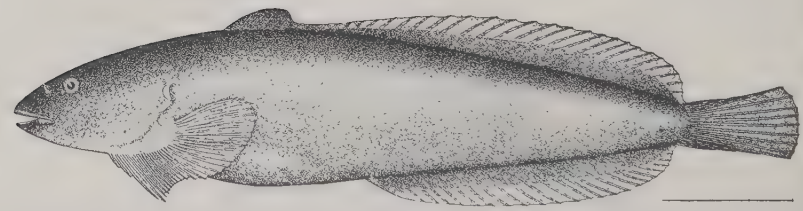
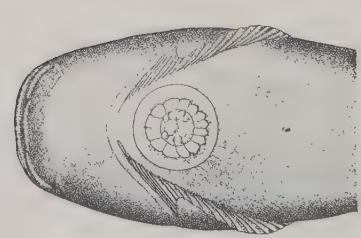
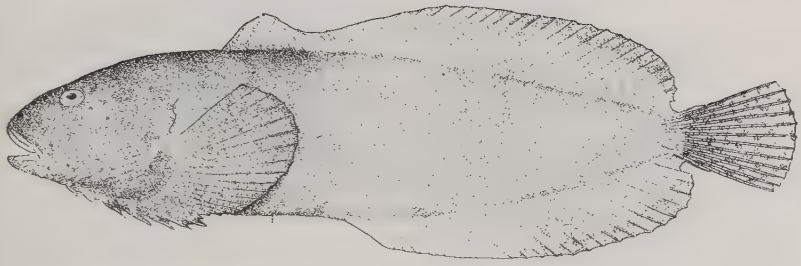


760

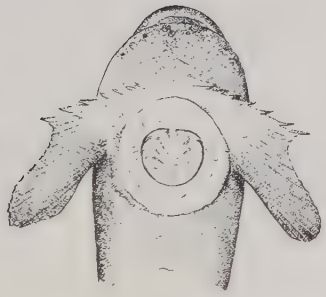


760*a*

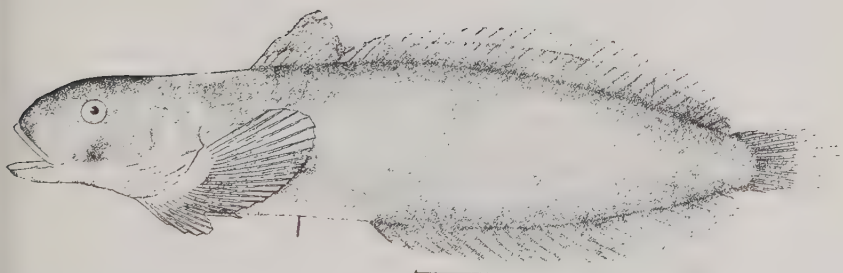
759. LETHOTREMUS VINOLENTUS. (P. 2101.)
760, 760*a*. NEOLIPARIS CALLYODON. (P. 2110.)



761



761*a*

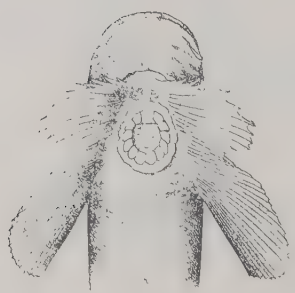


762

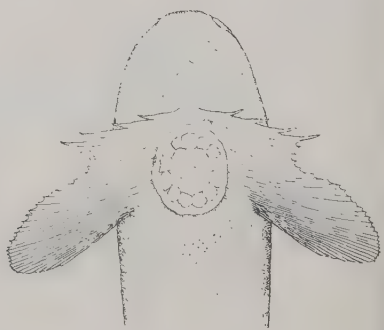
761, 761*a*. NEOLIPARIS MUCOSUS. (P. 2111.)
762. NEOLIPARIS FLORÆ. (P. 2111.)

764

763

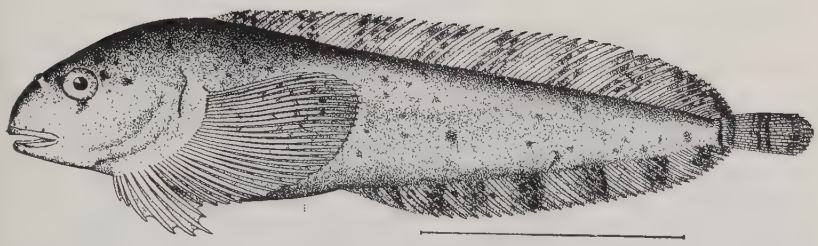


763*a*



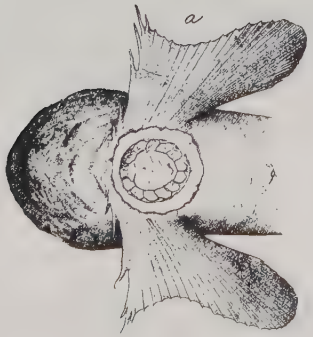
764*a*

763, 763*a*. NEOLIPARIS GREENI. (P. 2112.)
764, 764*a*. LIPARIS CYCLOPUS. (P. 2118.)



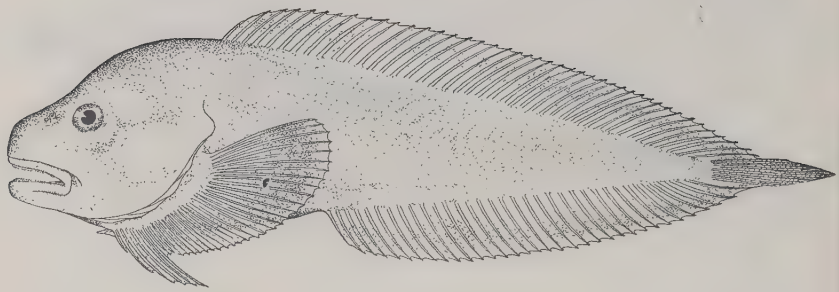
765

766

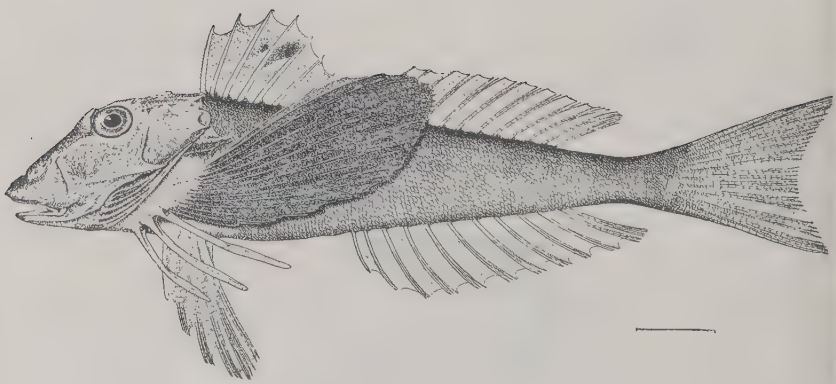


766*a*

765. LIPARIS AGASSIZII. (P. 2121.)
766, 766*a*. LIPARIS DENNYI. (P. 2124.)

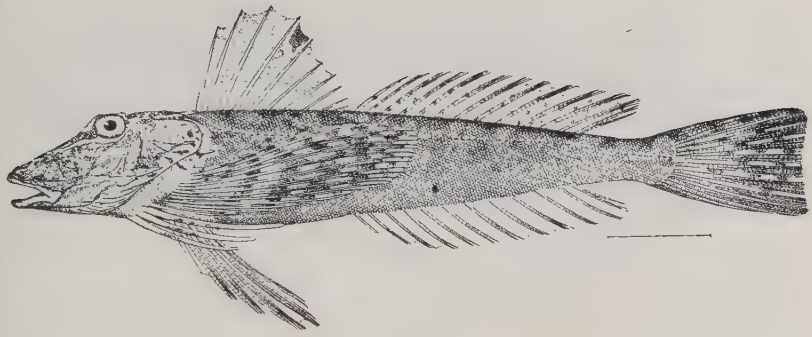


767

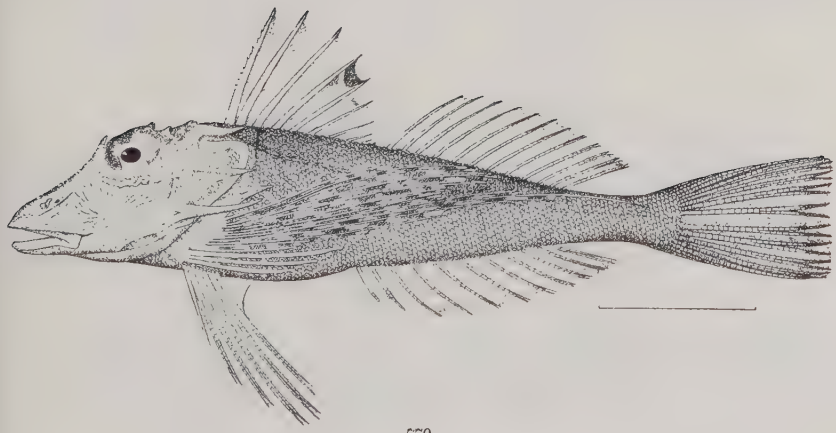


768

767. Bathyphasma ovigerum. (P. 2128.)
768. Prionotus carolinus. (P. 2156.)

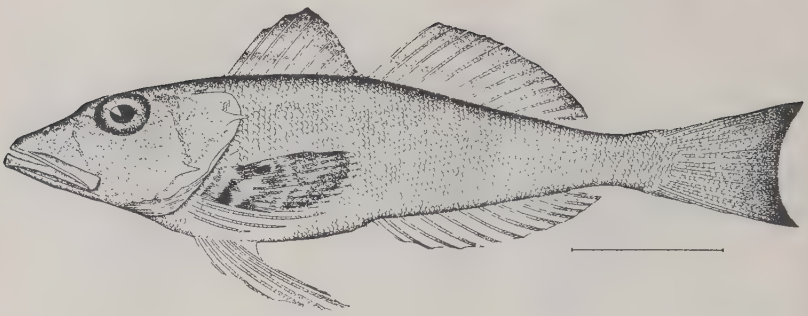


769



770

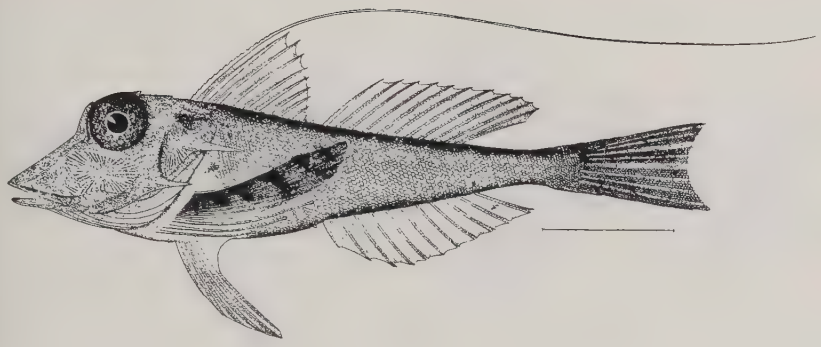
769. PRIONOTUS SCITULUS. (P. 2157.)
770. PRIONOTUS ALATUS. (P. 2159.)



771

772

771. PRIONOTUS STEARNSI. (P. 2166.)
772. PRIONOTUS EVOLANS. (P. 2168.)



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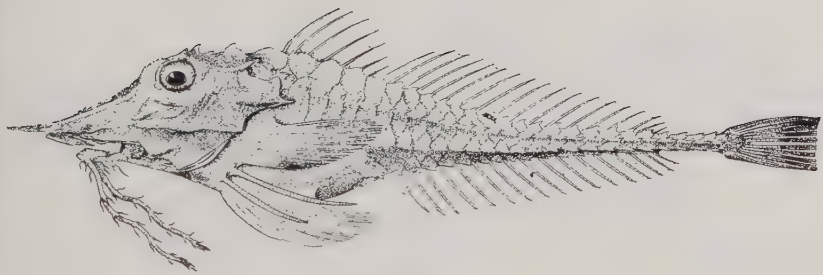
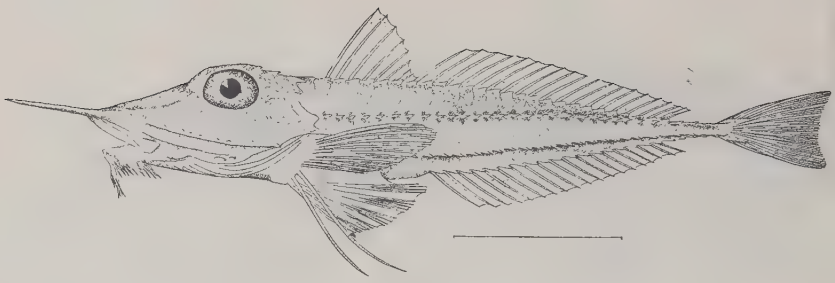


774

775

773. Bellator egretta. (P. 2174.)
774. Peristedion miniatum. (P. 2178.)
775. Peristedion longispathum. (P. 2178.)



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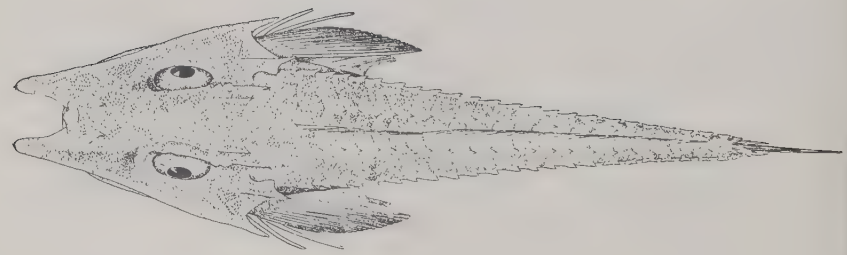
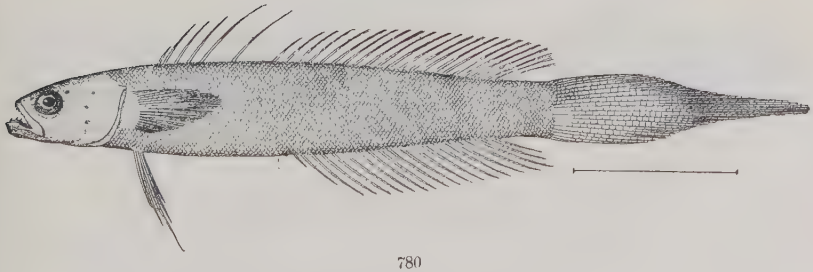


777*a*

776. PERISTEDION GRACILE. (P. 2179.)
777, 777*a*. PERISTEDION PLATYCEPHALUM. (P. 2180.)

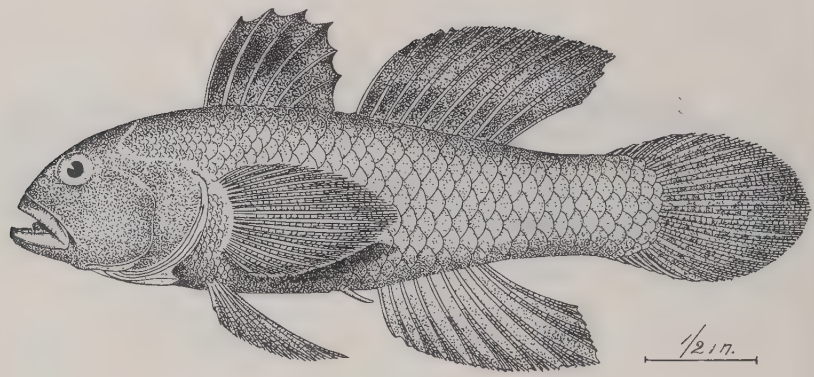
778

779



780

778. Cephalacanthus volitans. (P. 2183.)
779. Callionymus agassizii. (P. 2186.)
780. Ioglossus calliurus. (P. 2193.)



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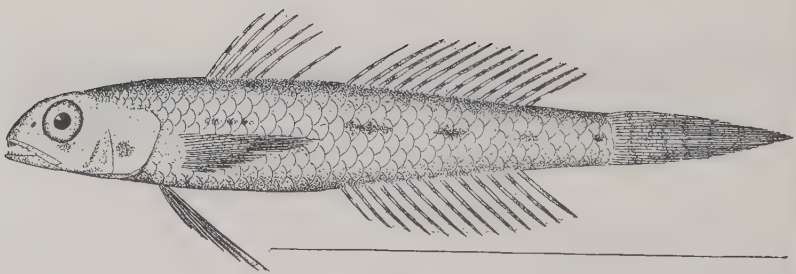

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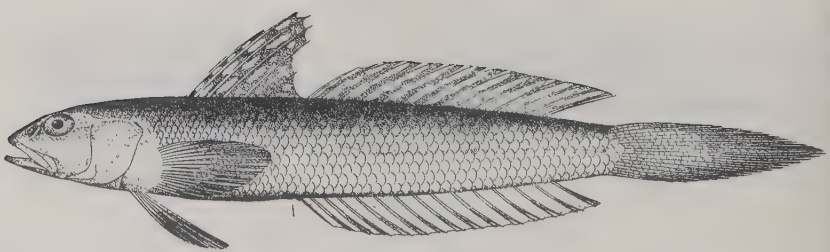
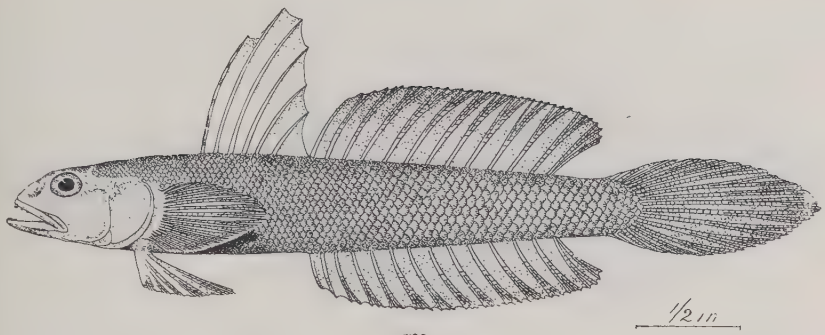


788

786. LOPHOGOBIUS CYPRINOIDES. (P. 2209.)
787. GOBIUS STIGMATICUS. (P. 2224.)
788. GOBIUS HASTATUS. (P. 2229.)



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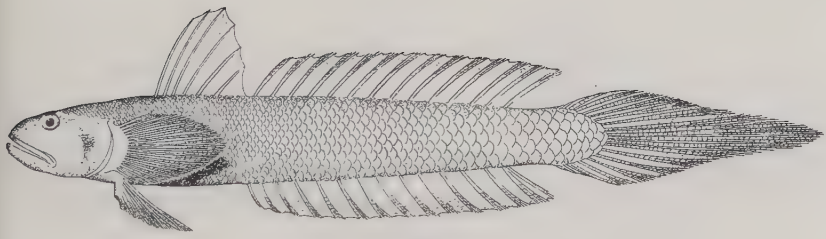
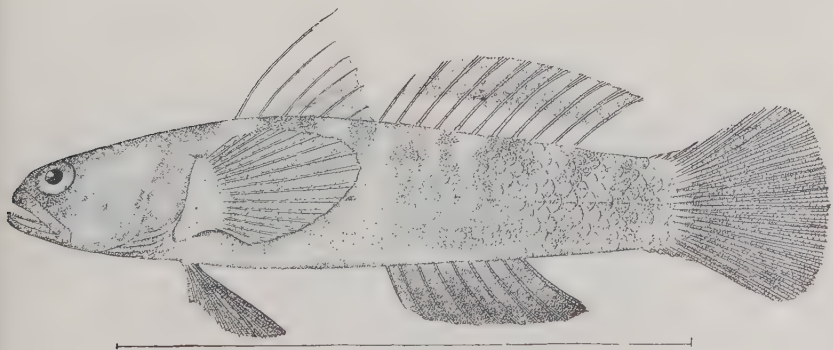
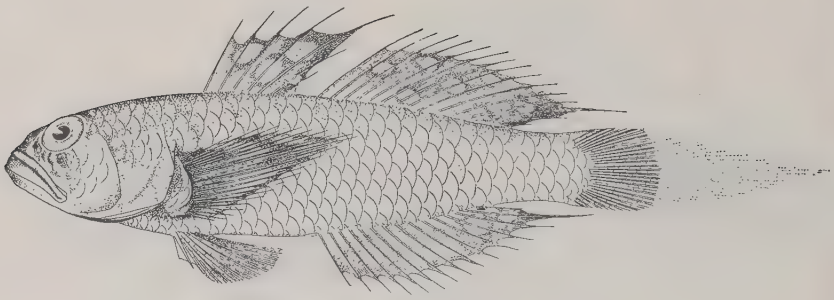


789*a*



790

789. 789*a*. GOBIUS OCEANICUS. (P. 2230.)
790 GARMANNIA PARADOXA. (P. 2232.)



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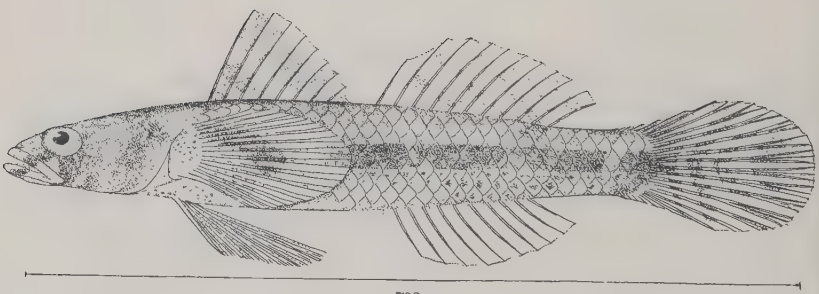

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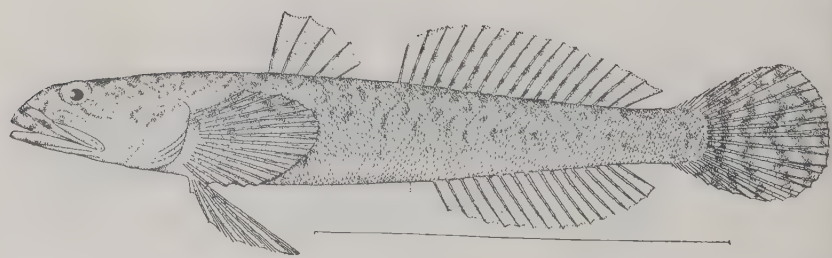
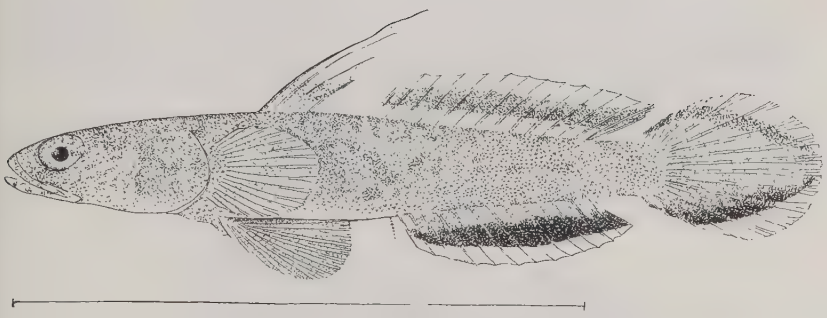


793

791. Bollmannia chlamydes. (P. 2238.)
792. Aboma etheostoma. (P. 2240.)
793. Clevelandia ios. (P. 2254.)



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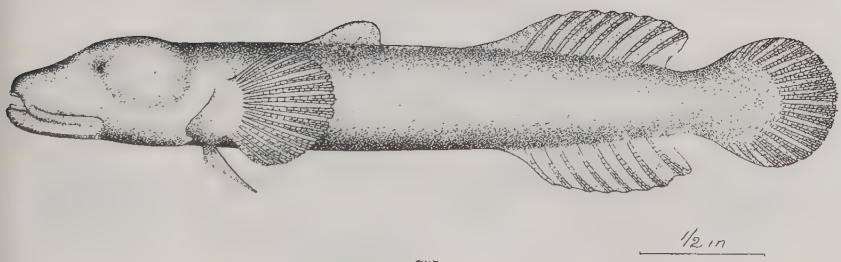
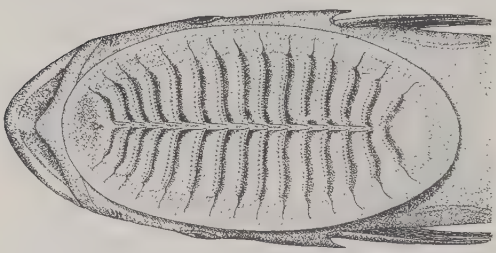


795

796

794. Evermannia zosterura. (P. 2256.)
795. Typhlogobius californiensis. (P. 2262.)
796. Echeneis naucrates. (P. 2269.)

797

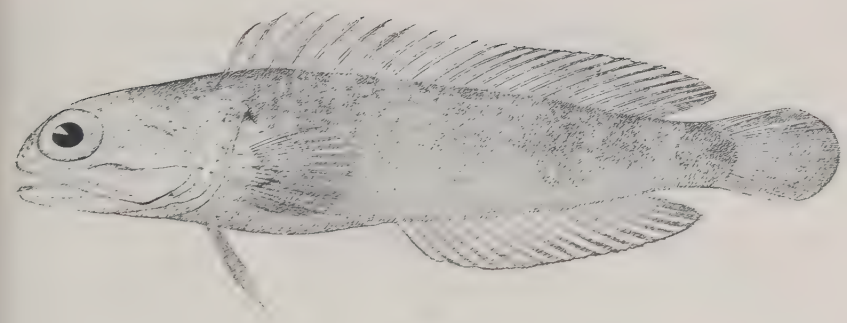


797*a*

798

799

797, 797*a*. Remora brachyptera. (P. 2272.)
798. Rhombochirus osteochir. (P. 2273.)
799. Caulolatilus microps. (P. 2277.)



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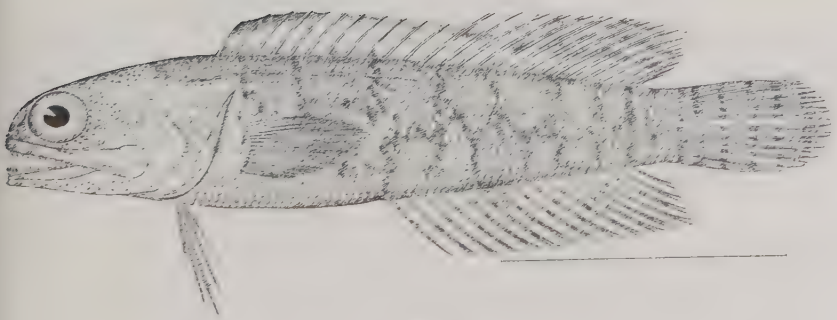
800a



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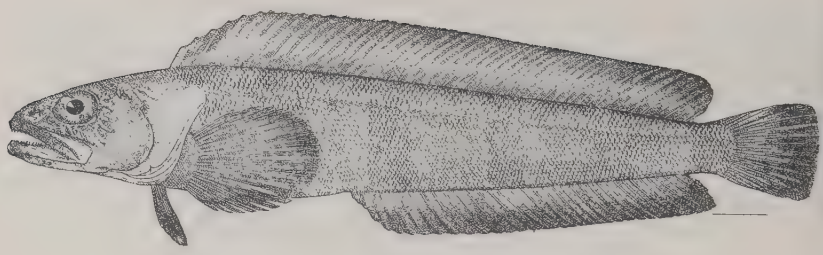
800, 800*a*. OPISTHOGNATHUS MACROGNATHUM. (P. 2281.)
801. GNATHYPOPS MAXILLOSA. (P. 2284.)



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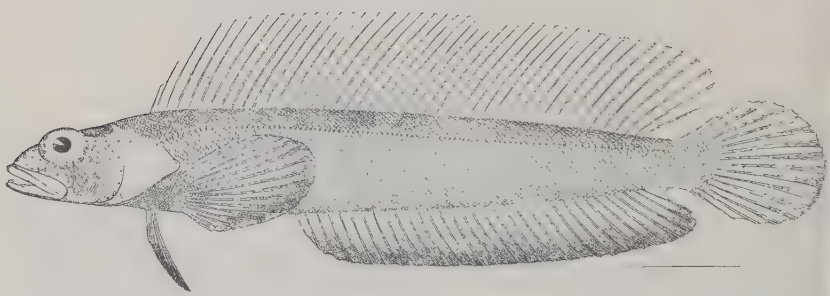
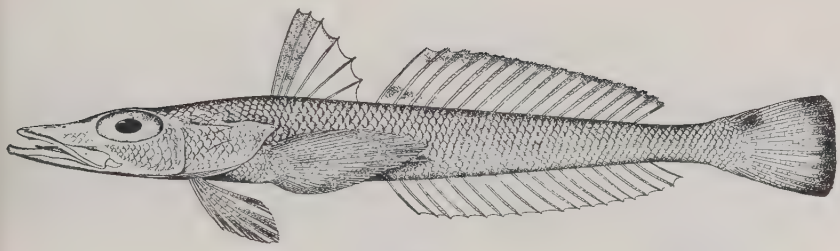


803

804

802. Bathymaster signatus. (P. 2288.)
803. Ronquilus jordani. (P. 2289.)
804. Chiasmodon niger. (P. 2291.)



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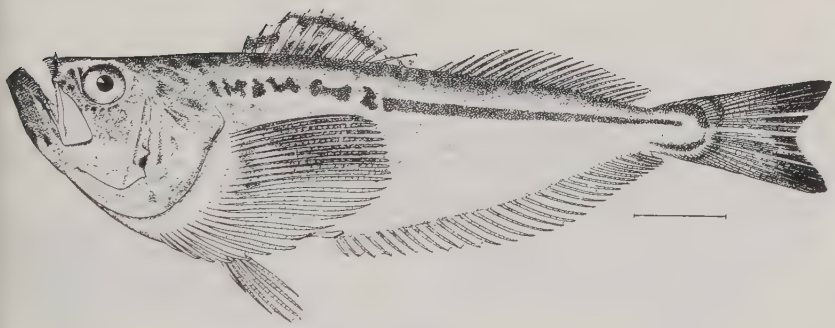


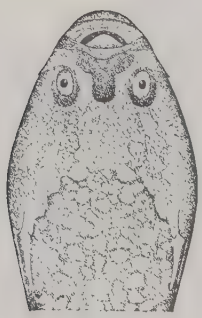
806

807

805. HYPSICOMETES GOBIOIDES. (P. 2294.)
806. TRICHODON TRICHODON. (P. 2295.)
807. ARCTOSCOPUS JAPONICUS. (P. 2297.)

808

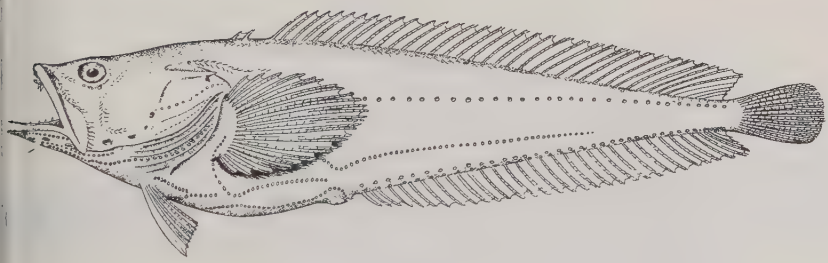
809



809*a*

808. Astroscopus y-græcum. (P. 2307.)
809, 809*a*. Kathetostoma albigutta. (P. 2312.)

810



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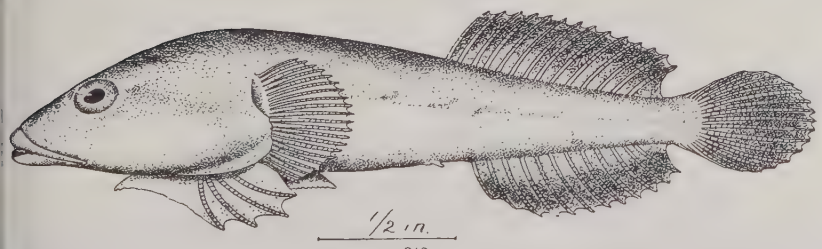
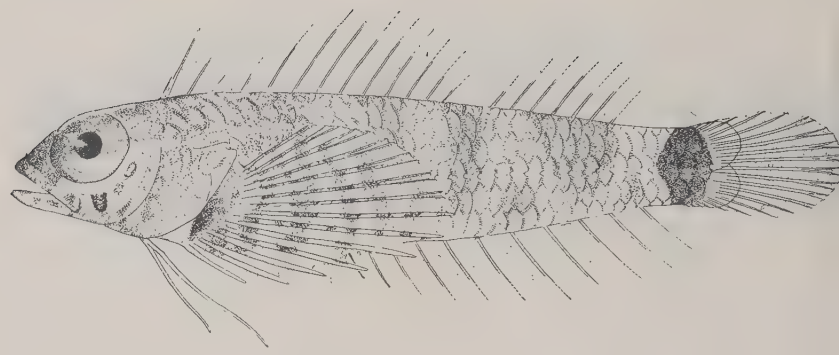


812

813

810. Opsanus pardus. (P. 2316.)
811. Porichthys porosissimus. (P. 2319.)
812. Caularchus mæandricus. (P. 2328.)
813. Rimicola muscarum. (P. 2338.)



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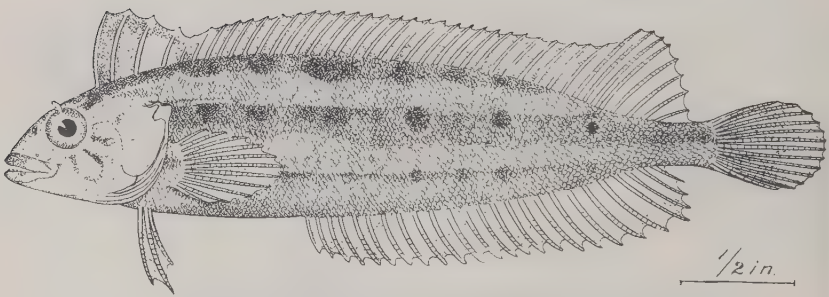

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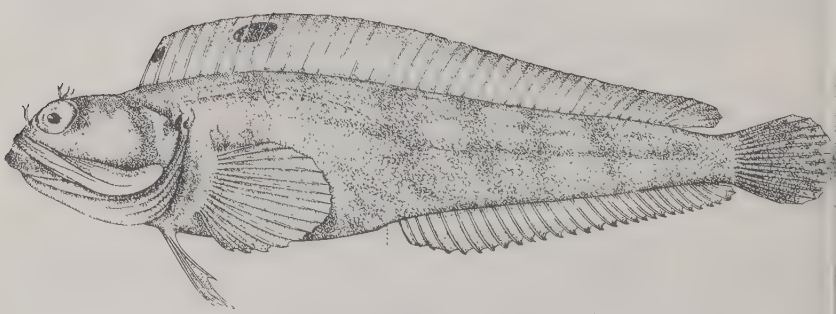
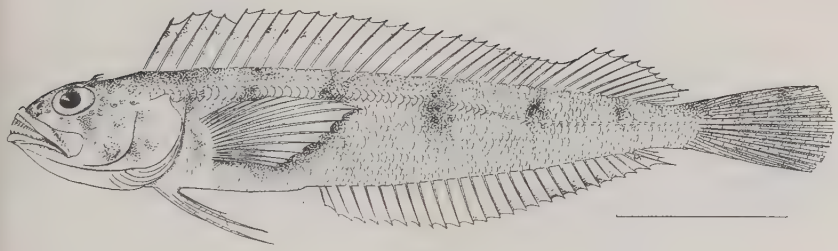


816

814. Enneanectes carminalis. (P. 2350.)
815. Gibbonsia elegans evides. (P. 2352.)
816. Neoclinus satiricus. (P. 2355.)



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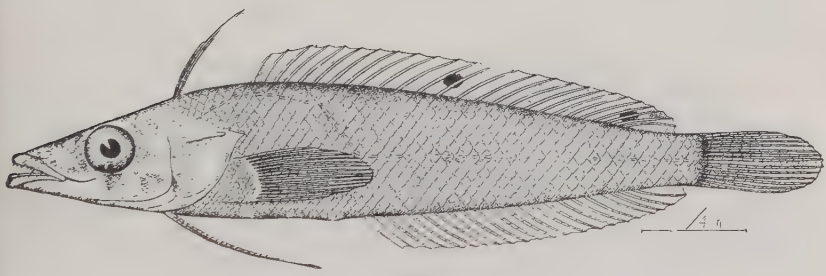

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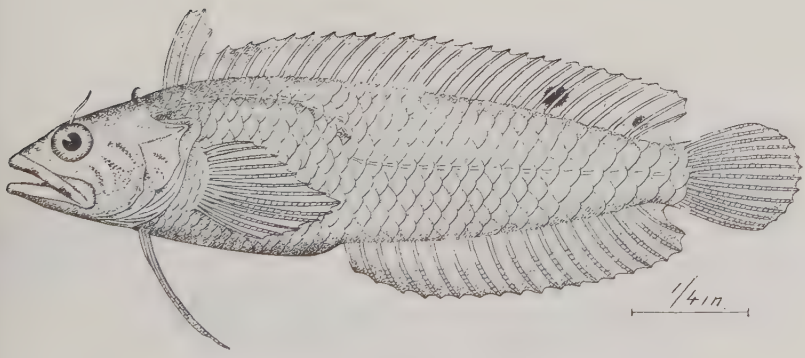
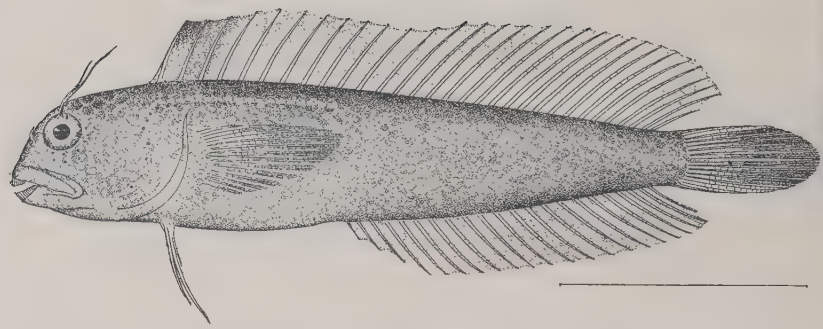


819

817. CRYPTOTREMA CORALLINUM. (P. 2366.)
818. EXERPES ASPER. (P. 2367.)
819. AUCHENOPTERUS NOX. (P. 2373.)



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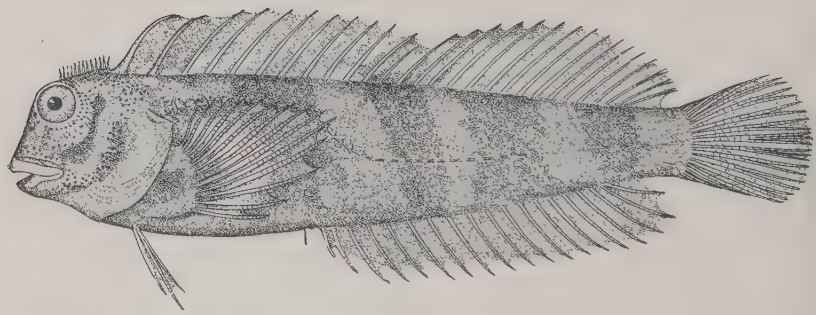
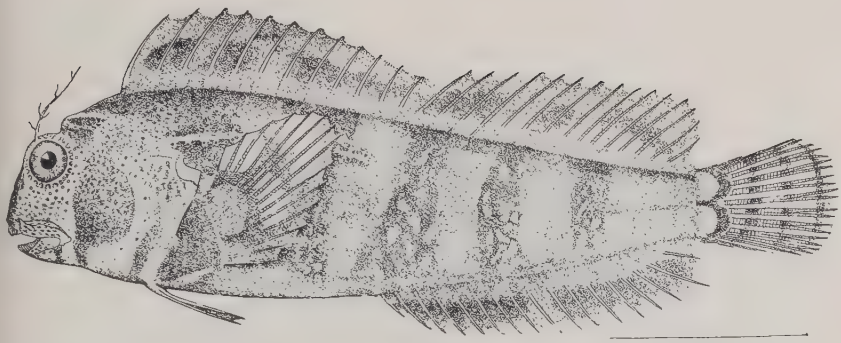


821

822

820. Blennius favosus. (P. 2380.)
821. Blennius cristatus. (P. 2382.)
822. Hypsoblennius ionthas. (P. 2388.)



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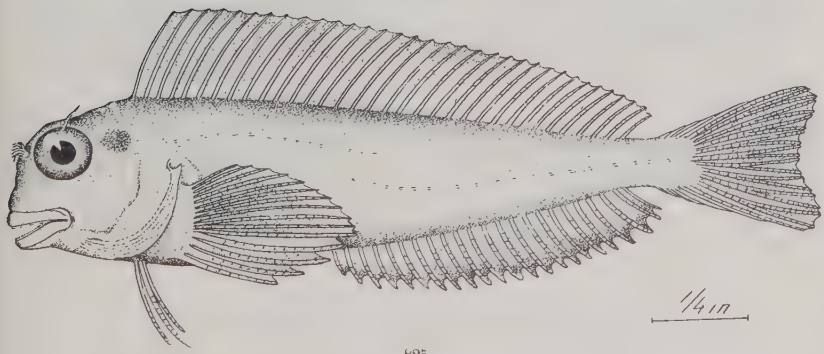
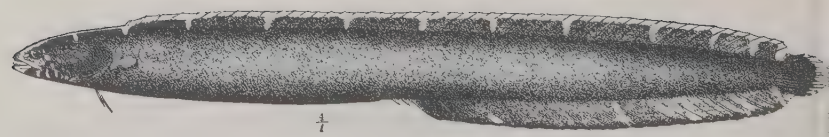


825

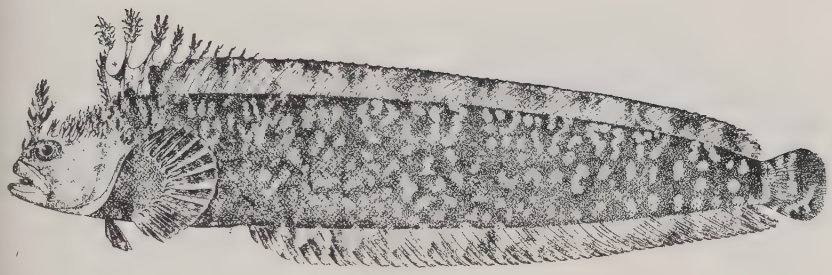
823. Hypsoblennius hentz. (P. 2390.)
824. Chasmodes saburræ. (P. 2392.)
825. Rupiscartes atlanticus. (P. 2397.)

826



827

826. Emblemaria atlantica. (P. 2402.)
827. Stathmonotus hemphillii. (P. 2407.)



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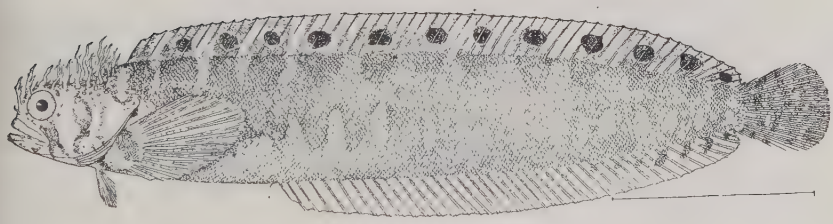
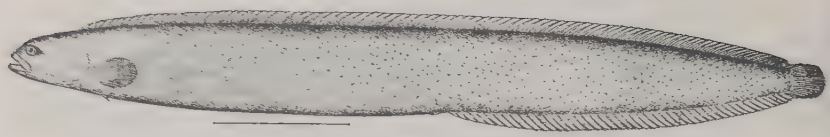


829

830

828. BRYOSTEMA POLYACTOCEPHALUM. (P. 2408.)
829. BRYOSTEMA NUGATOR. (P. 2410.)
830. APODICHTHYS FLAVIDUS. (P. 2411.)



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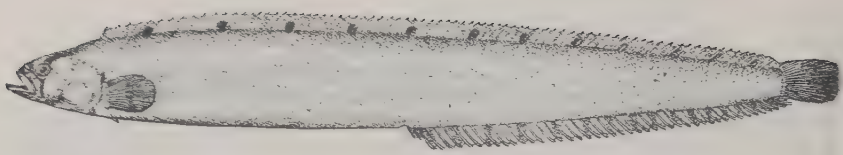

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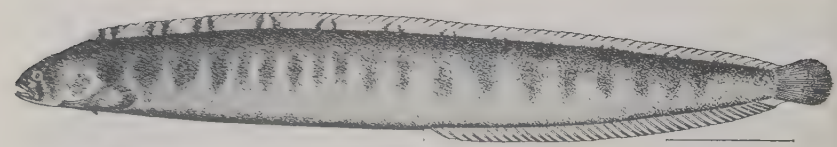
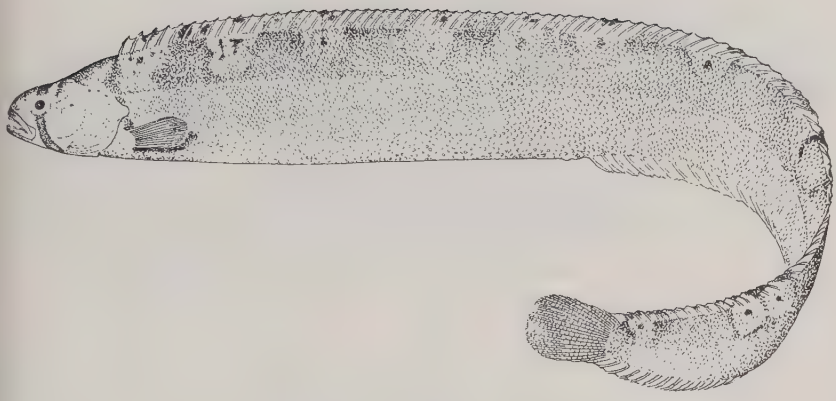


833

831. PHOLIS DOLICHOGASTER. (P. 2416.)
832. PHOLIS GUNNELLUS. (P. 2419.)
833. PHOLIS ORNATUS. (P. 2419.)



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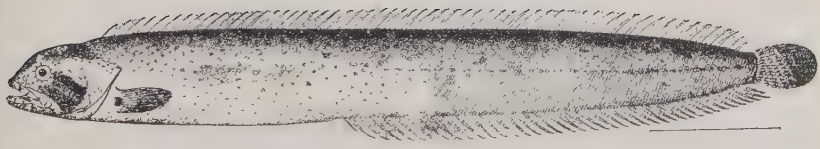

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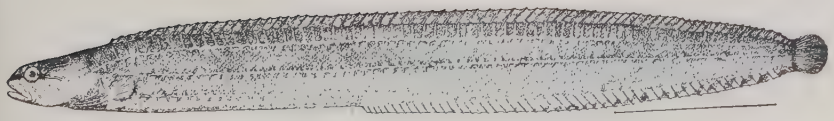
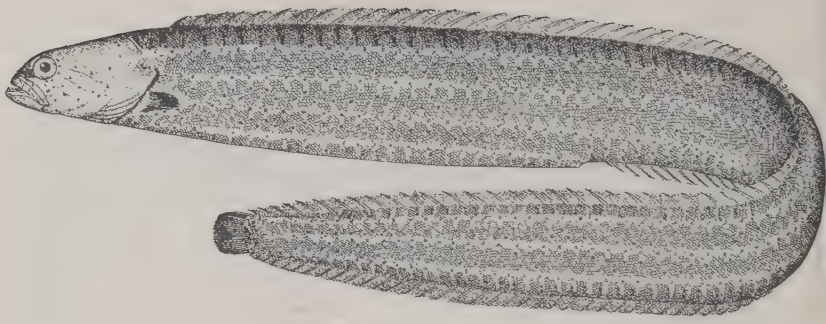


836

834. ASTERNOPTERYX GUNNELLIFORMIS. (P. 2420.)
835. ANOPLARCHUS ATROPURPUREUS. (P. 2422.)
836. XIPHISTES ULVÆ. (P. 2423.)



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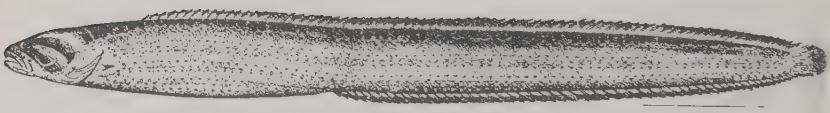

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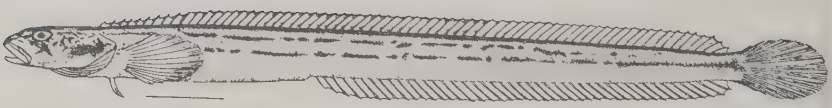
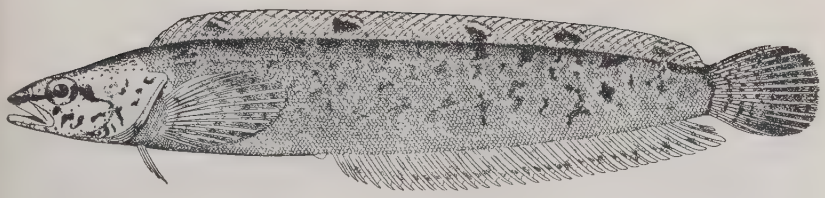


839

840

837. XIPHISTES CHIRUS. (P. 2424.)
838. XIPHIDION RUPESTRE. (P. 2426.)
839. LUMPENUS MACKAYI. (P. 2436.)
840. LUMPENUS LAMPETRÆFORMIS. (P. 2438.)



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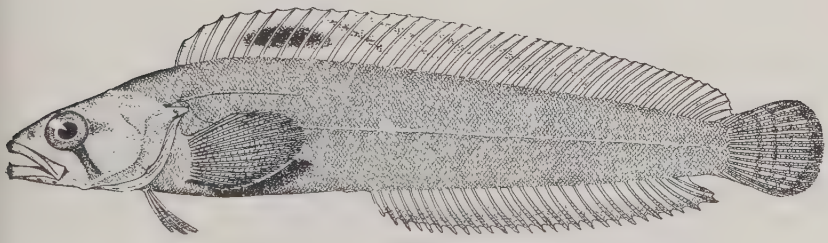
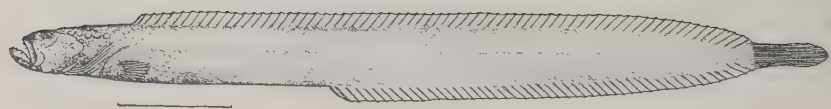


842

843

841. Stichæus punctatus. (P. 2439.)
842. Ulvaria subbifurcata. (P. 2440.)
843. Cryptacanthodes maculatus. (P. 2443.)



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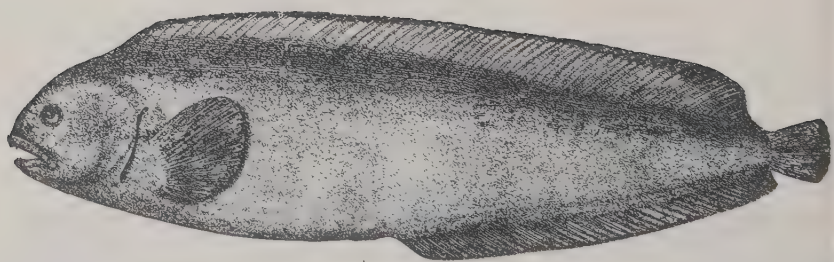
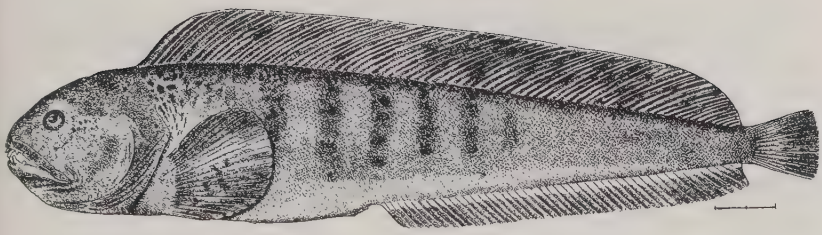


845

844. LYCONECTES ALEUTENSIS. (P. 2444.)
845. ANARHICHAS LATIFRONS. (P. 2446.)



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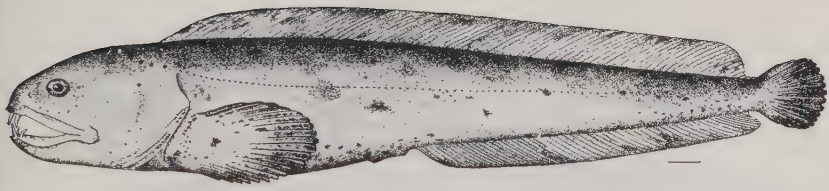


847

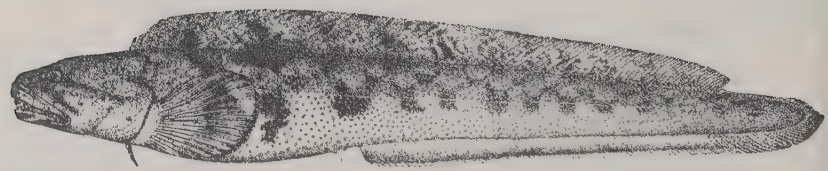
848

846. ANARHICHAS LUPUS. (P. 2446.)
847. ANARHICHAS LEPTURUS. (P. 2447.)
848. PTILICHTHYS GOODEI. (P. 2452.)

849

849*a*

849*b*



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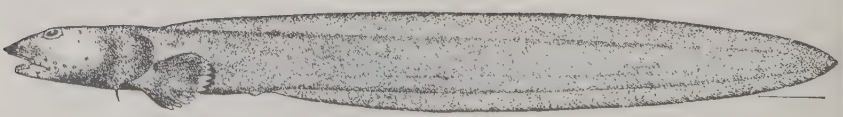
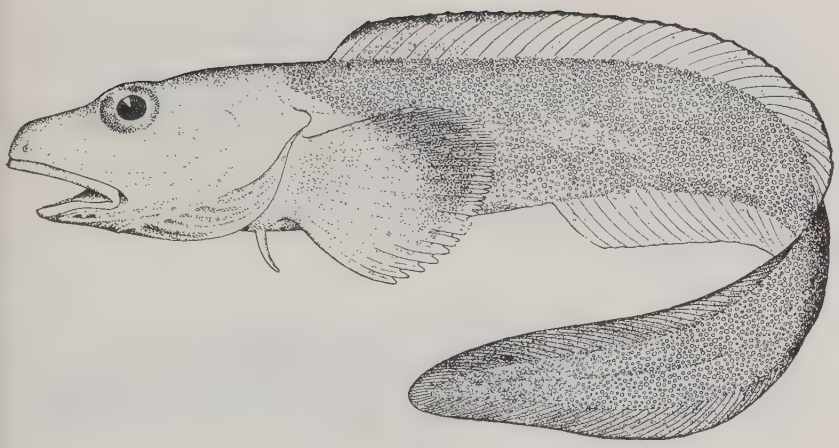


851

849, 849*a*, 849*b*. SCYTALINA CERDALE. (P. 2454.)
850. ZOARCES ANGUILLARIS. (P. 2457.)
851. EMBRYX CROTALINUS. (P. 2458.)

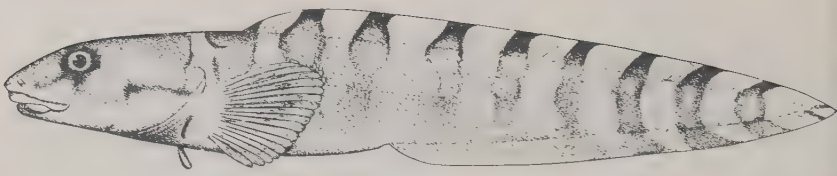


852

853

854

852. APRODON CORTEZIANUS. (P. 2461.)
853. LYCODES ZOARCHUS. (P. 2464.)
854. LYCODES RETICULATUS. (P. 2465.)



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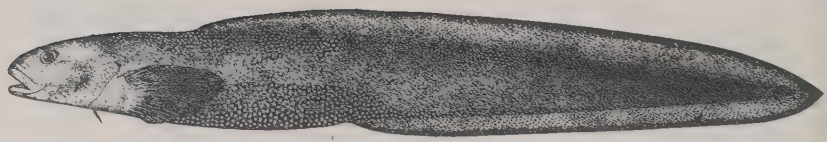

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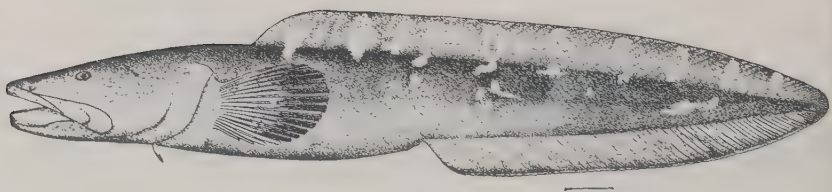
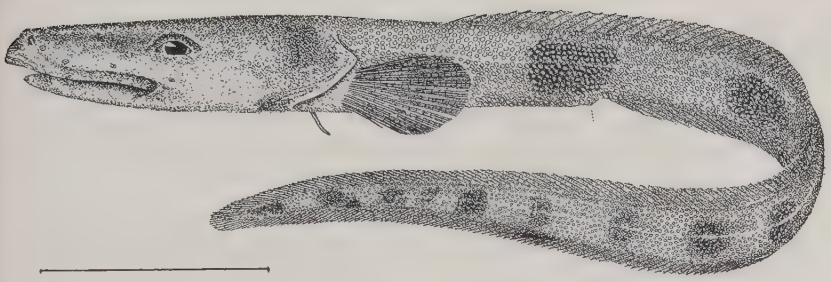


857

858

855. LYCODES PERSPICILLUM. (P. 2465.)
856. LYCODES FRIGIDUS. (P. 2465.)
857. LYCODALEPIS POLARIS. (P. 2468.)
858. LYCODALEPIS TURNERI. (P. 2468.)



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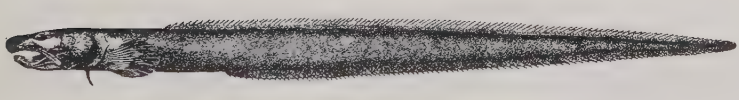

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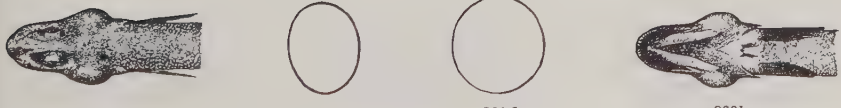
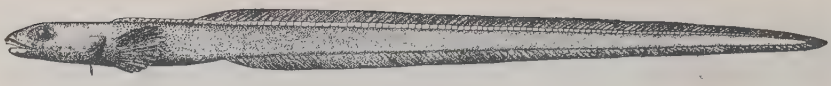


860*a* 860*c* 860*d* 860*b*

861

859. LYCENCHELYS VERRILLII. (P. 2470.)
860, 860*a*, 860*b*, 860*c*, 860*d*. LYCENCHELYS PAXILLUS. (P. 2471.)
861. FURCIMANUS DIAPTERUS. (P. 2472.)



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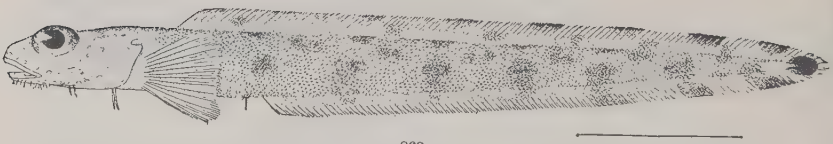

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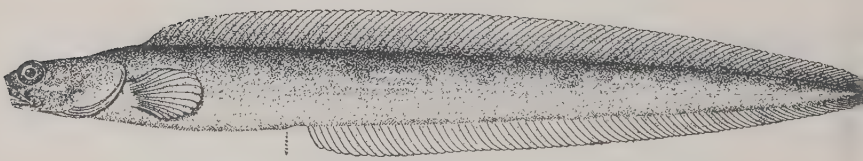


864

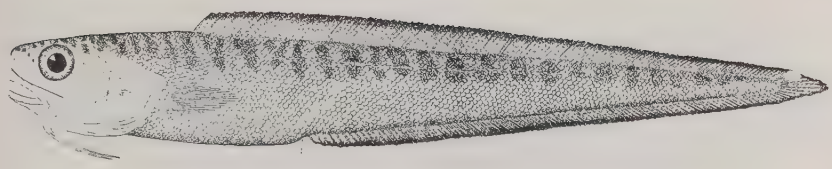
864*a*

864*b*

864*c*

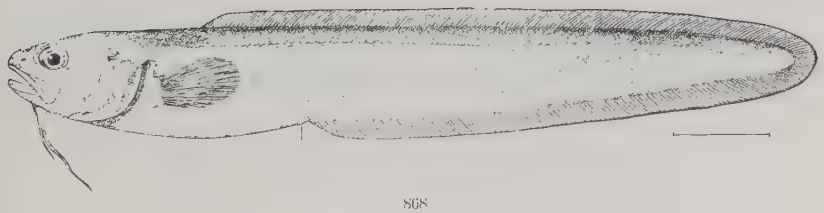
865

862. Lycodonus mirabilis. (P. 2474.)
863. Lyconema barbatum. (P. 2474.)
864, 864*a*, 864*b*, 864*c*. Gymnelis viridis. (P. 2477.)
865. Melanostigma pammelas. (P. 2479.)



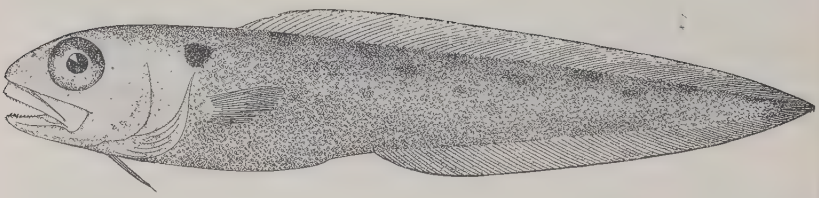
866

867



868

866. LEPOPHIDIUM MARMORATUM. (P. 2482.)
867. LEPOPHIDIUM PROFUNDORUM. (P. 2484.)
868. RISSOLA MARGINATA. (P. 2489.)



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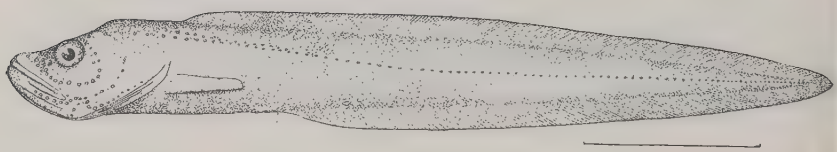

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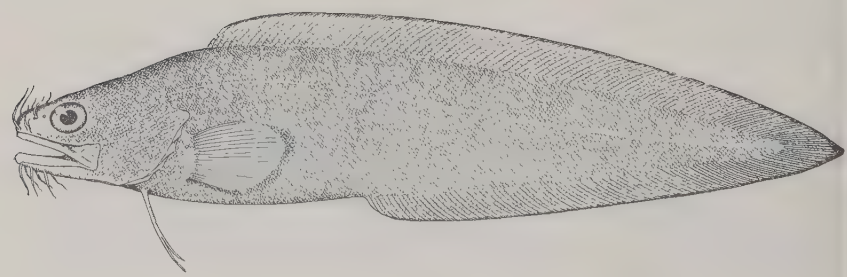
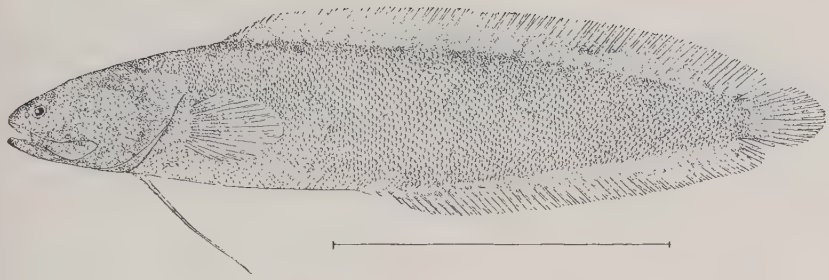


871

869. Otophidium omostigmum. (P. 2490.)
870. Lycodapus dermatinus. (P. 2492.)
871. Brotula barbata. (P. 2500.)



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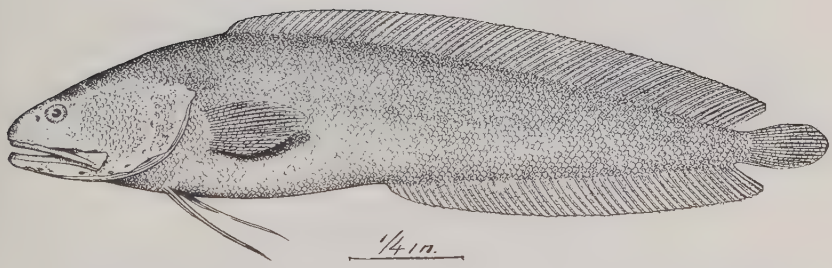

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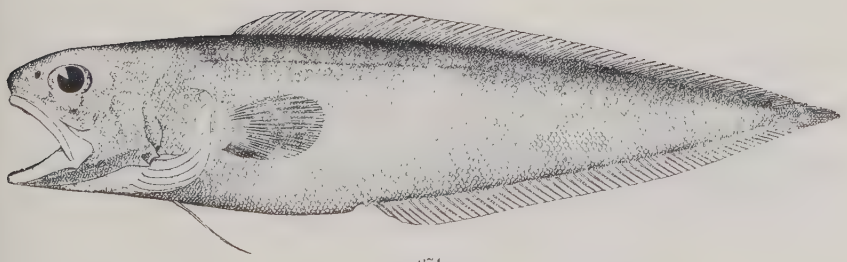
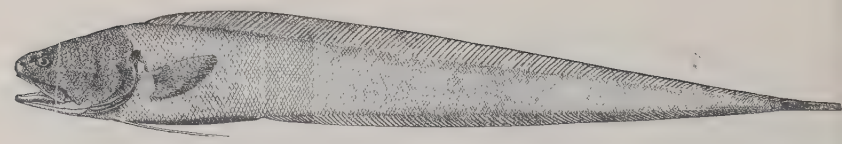


874

872. Ogilbia ventralis. (P. 2503.)
873. Ogilbia cayorum. (P. 2503.)
874. Dicrolita agassizii. (P. 2506.)



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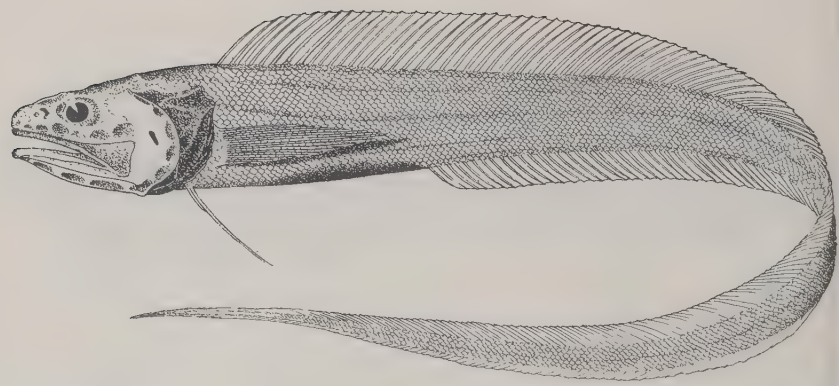
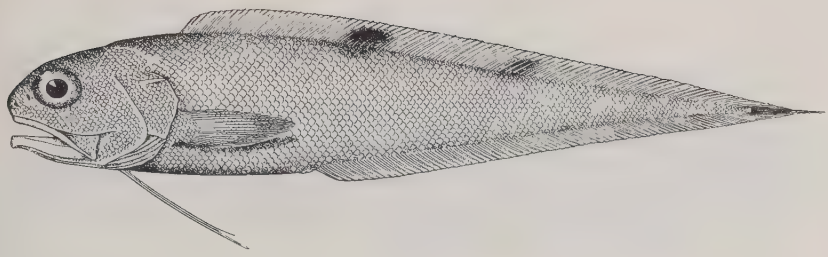


876

876*a*

875. Bassozetus normalis. (P. 2507.)
876, 876*a*. Bassozetus catena. (P. 2509.)



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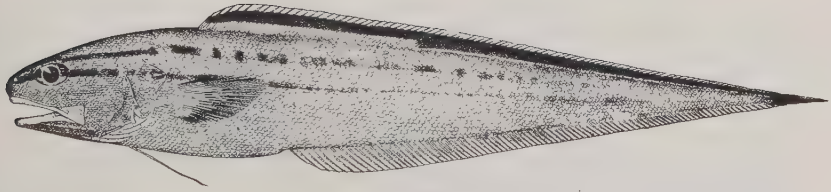

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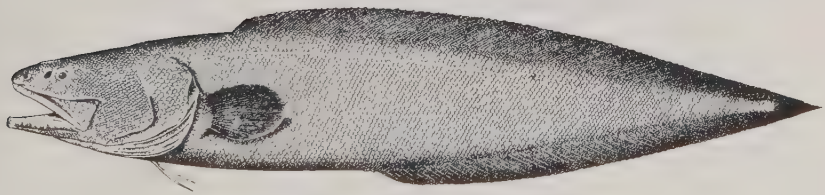
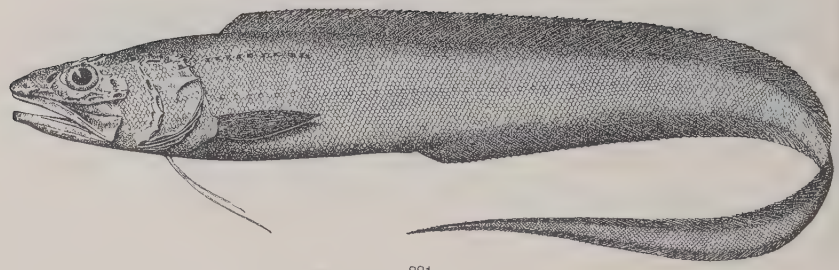


879

880

877. NEOBYTHITES GILLII. (P. 2512.)
878. NEOBYTHITES MARGINATUS. (P. 2513.)
879. BASSOGIGAS GILLII. (P. 2515.)
880. BARATHRODEMUS MANATINUS. (P. 2517.)



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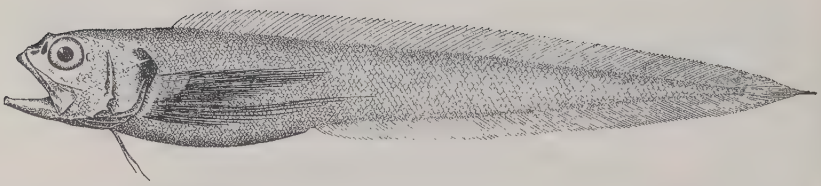

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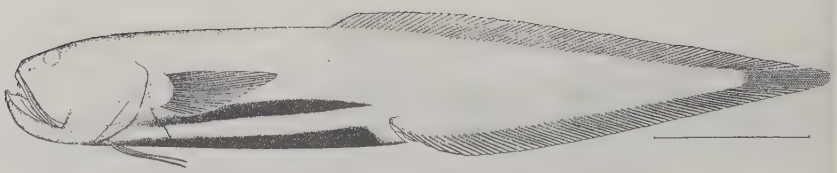
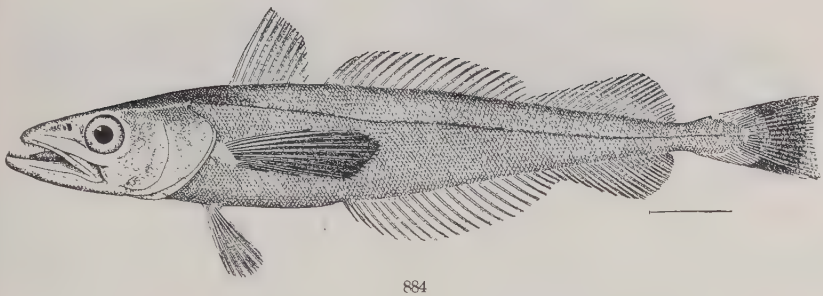


883

881. Porogadus miles. (P. 2520.)
882. Dicrolene intronigra. (P. 2522.)
883. Barathronus bicolor. (P. 2524.)



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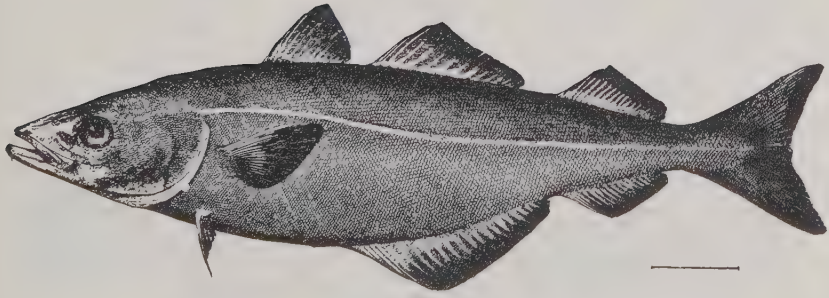
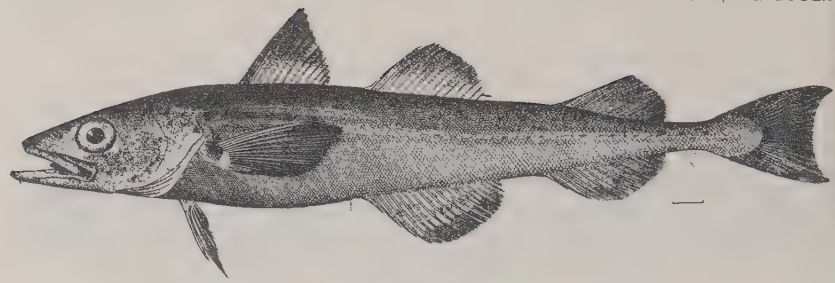


886

884. MERLUCCIUS PRODUCTUS. (P. 2531.)
885. BOROGADUS SAIDA. (P. 2533.)
886. POLLACHIUS VIRENS. (P. 2534.)



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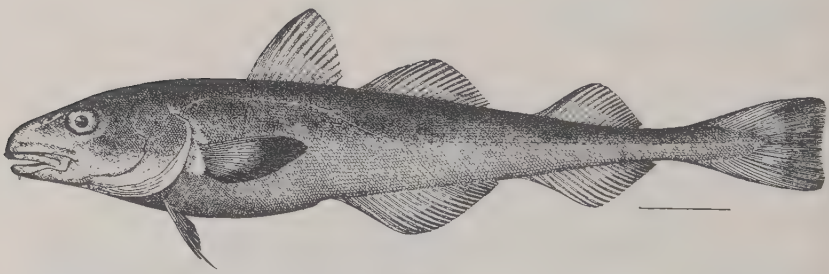

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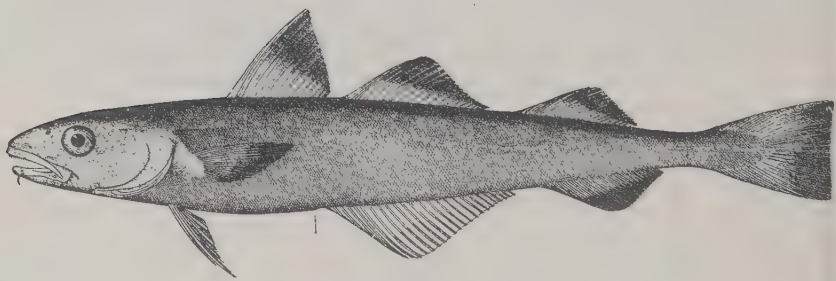
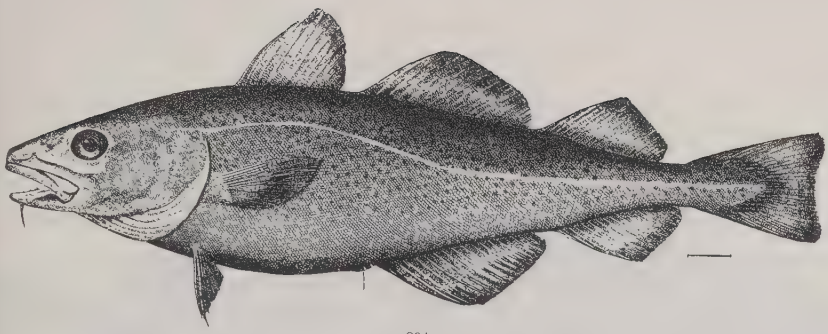


889

890

887. THERAGRA CHALCOGRAMMA. (P. 2535.)
888. ELEGINUS NAVAGA. (P. 2537.)
889. MICROGADUS PROXIMUS. (P. 2539.)
890. MICROGADUS TOMCOD. (P. 2540.)



891

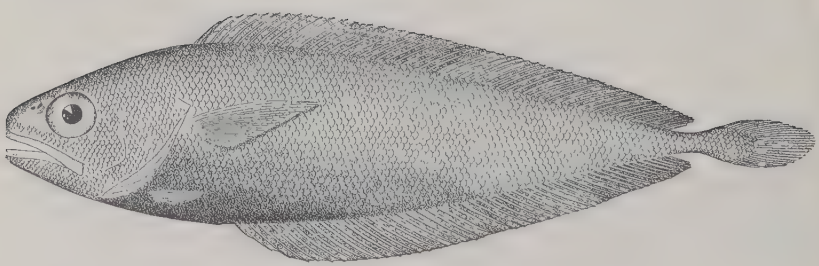
892

892*a*

891. GADUS COLLARIAS. (P. 2541.)
892. MELANOGRAMMUS ÆGLEFINUS. (P. 2542.)
892*a*. MELANOGRAMMUS ÆGLEFINUS; SKULL. (P. 2542.)

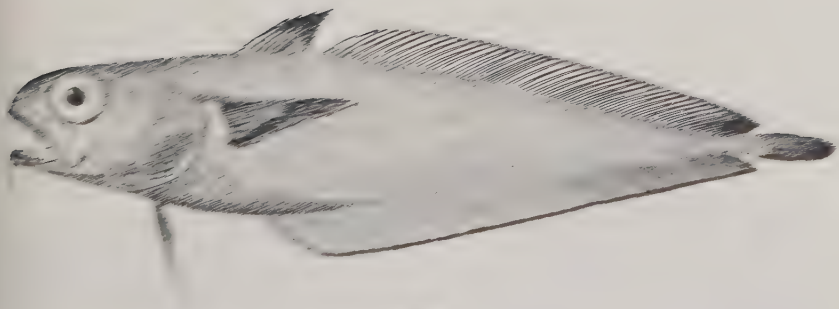
893

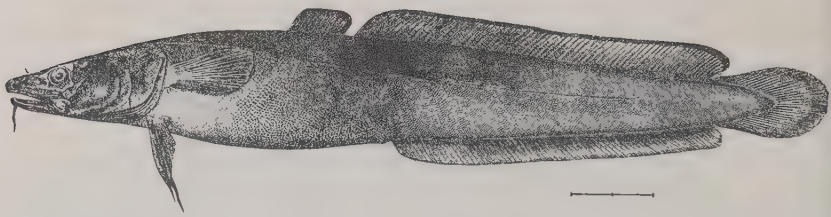
893*a*



894

893, 893*a*. ANTIMORA VIOLA. (P. 2544.)
894. URALEPTUS MALARDI. (P. 2545.)





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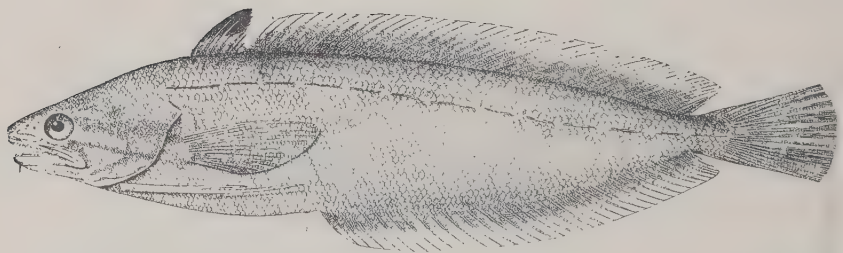
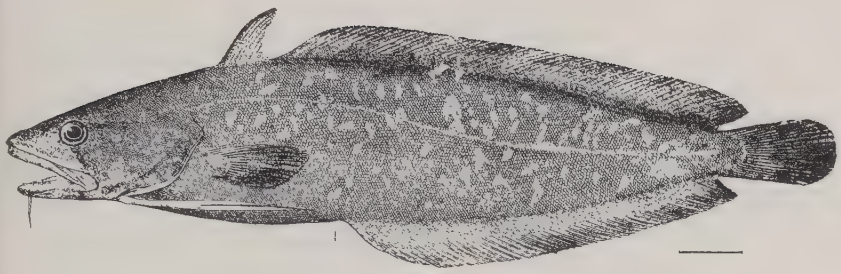


898

899

897. LOTA MACULOSA. (P. 2550.)
898. UROPHYCIS REGIUS. (P. 2553.)
899. UROPHYCIS CIRRATUS. (P. 2553.)



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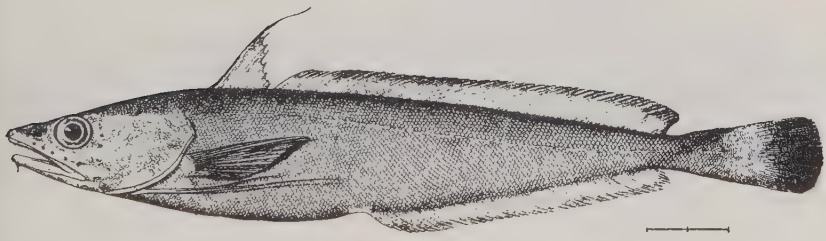
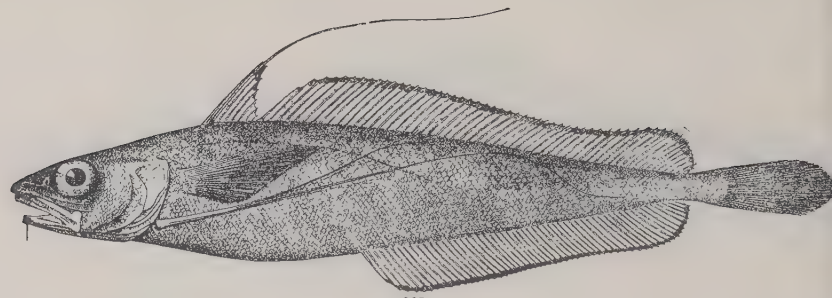


901

902

900. UROPHYCIS EARLLI. (P. 2554.)
901. UROPHYCIS TENUIS. (P. 2555.)
902. UROPHYCIS CHUSS. (P. 2555.)



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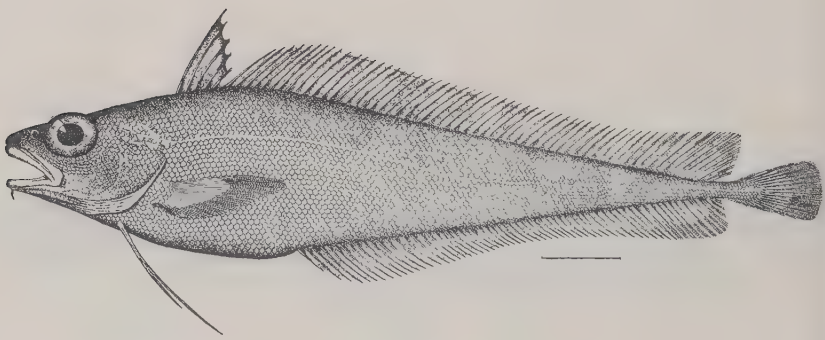

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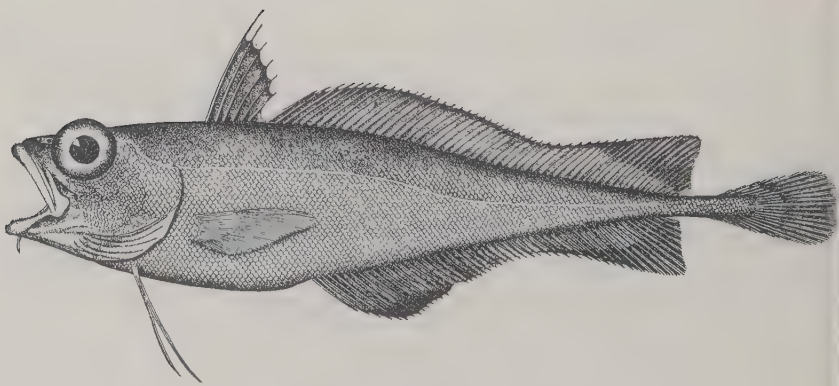

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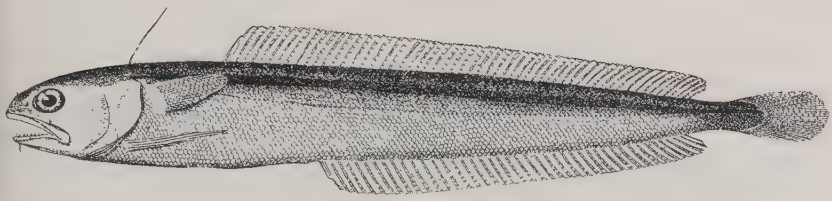
903. UROPHYCIS CHESTERI. (P. 2556.)
904. LEMONEMA BARBATULUM. (P. 2556.)
905. LEMONEMA MELANURUM. (P. 2557.)



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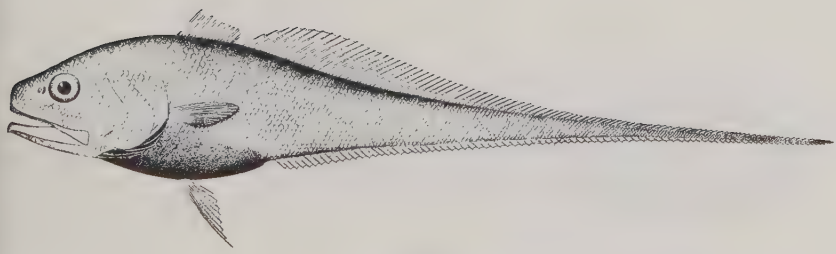
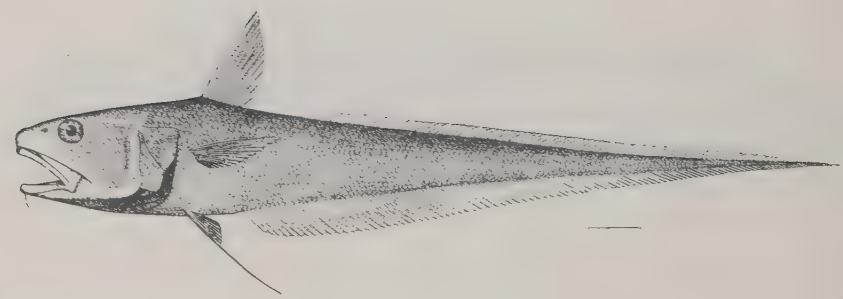


908

906. GAIRDROPSARUS ARGENTATUS. (P. 2559.)
907. ENCHELYOPUS CIMBRIUS. (P. 2560.)
908. BATHYGADUS FAVOSUS. (P. 2565.)

909



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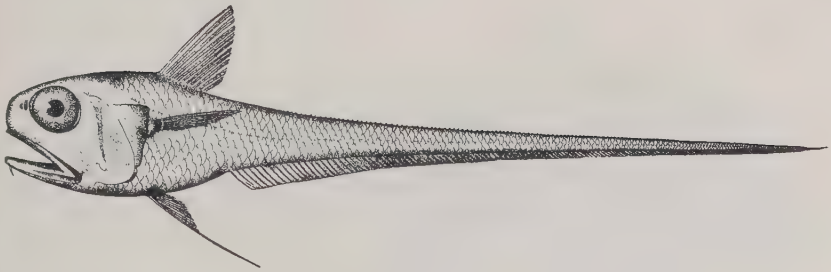
911

909. Steindachneria argentea. (P. 2568.)
910. Chalinura simula. (P. 2578.)
911. Coryphænoides carapinus. (P. 2579.)



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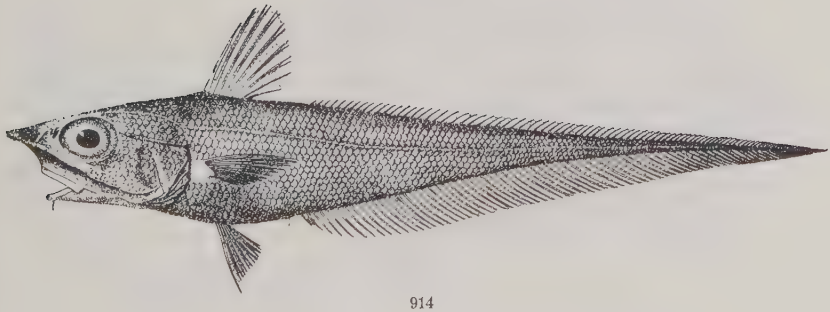

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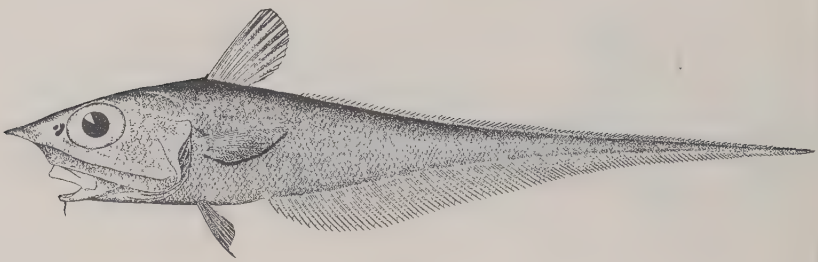
912. HYMENOCEPHALUS CAVERNOSUS. (P. 2580.)
913. CŒLORHYNCHUS OCCA. (P. 2588.)
914. CŒLORHYNCHUS CARMINATUS. (P. 2588.)



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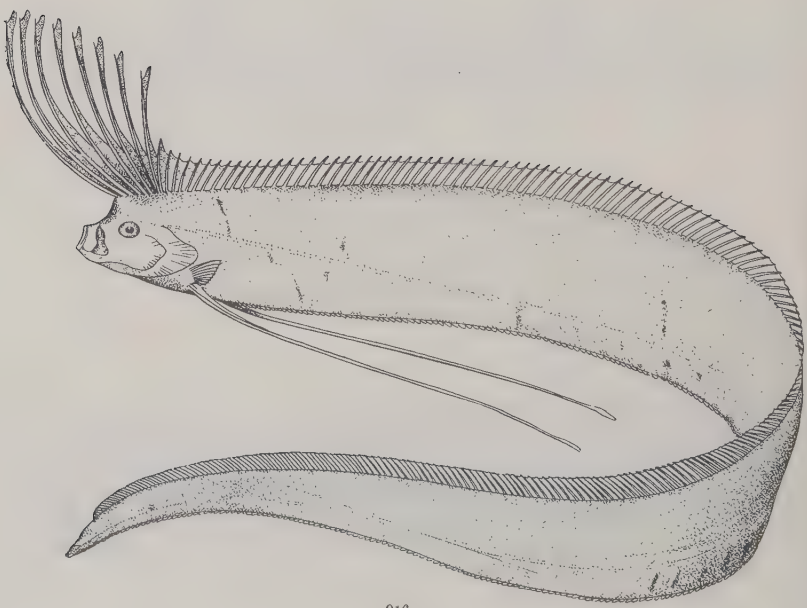

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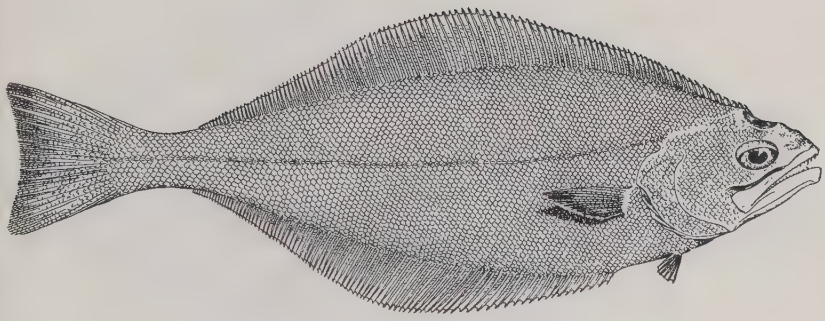
915. Cœlorhynchus caribbæus. (P. 2589.)
916. Regalecus glesne. (P. 2596.)



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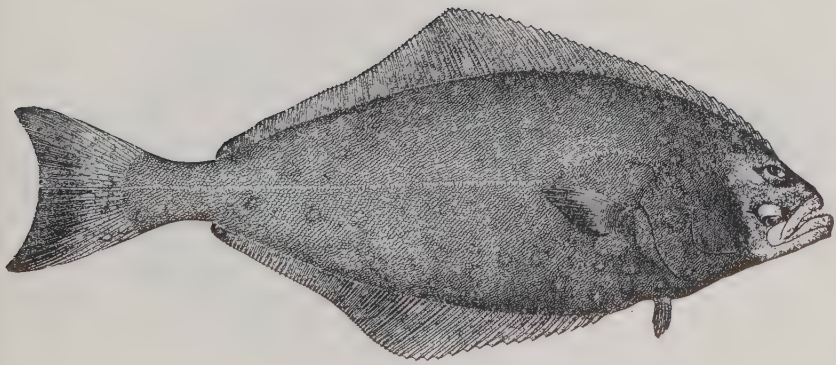

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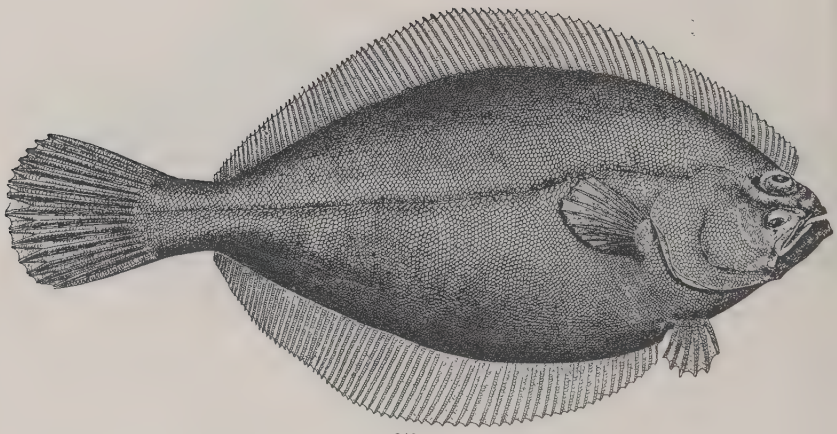
917. Atheresthes stomias. (P. 2609.)
918. Hippoglossus hippoglossus. (P. 2611.)



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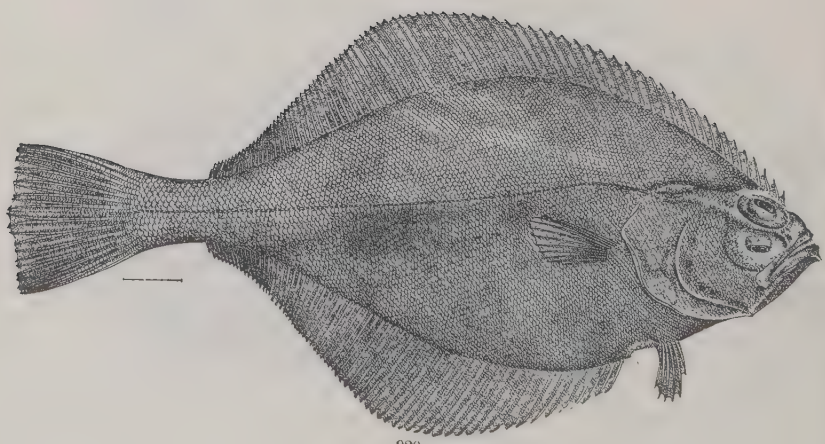

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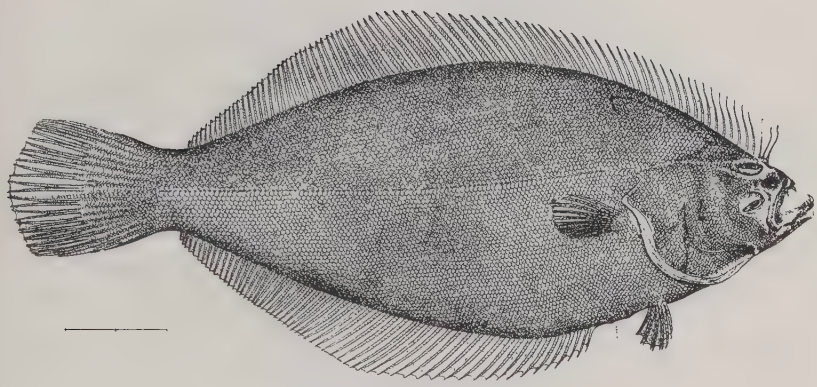
919. HIPPOGLOSSOIDES PLATESSOIDES. (P. 2614.)
920. HIPPOGLOSSOIDES ELASSODON. (P. 2615.)



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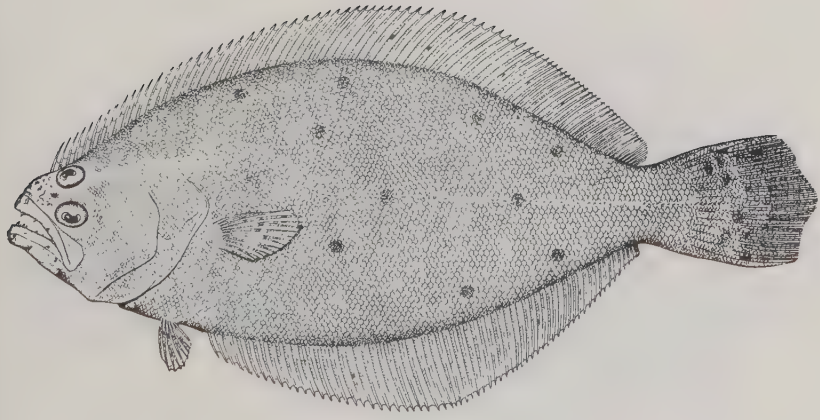

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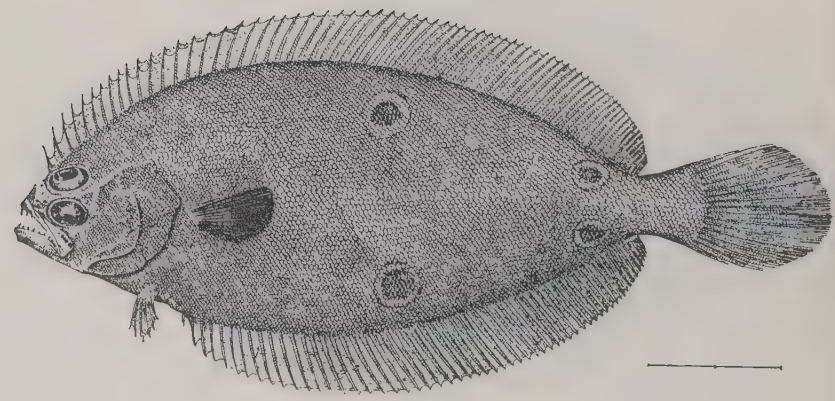
921. PSETTICHTHYS MELANOSTICTUS. (P. 2618.)
922. PARALICHTHYS DENTATUS. (P. 2629.)

923



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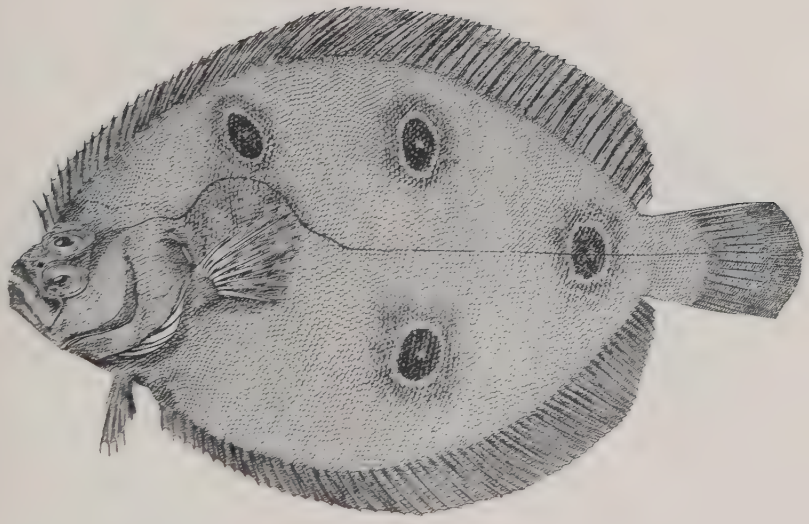
923. PARALICHTHYS SQUAMILENTUS. (P. 2631.)
924. PARALICHTHYS OBLONGUS. (P. 2632.)



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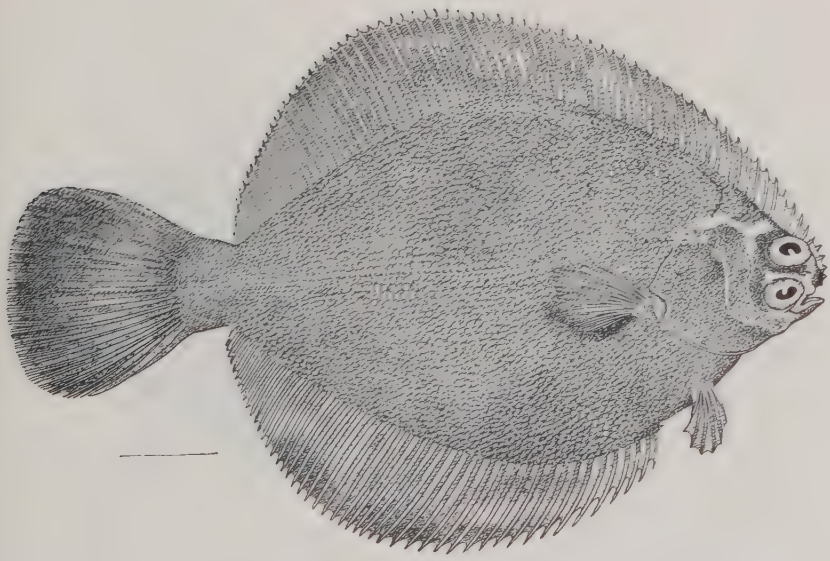

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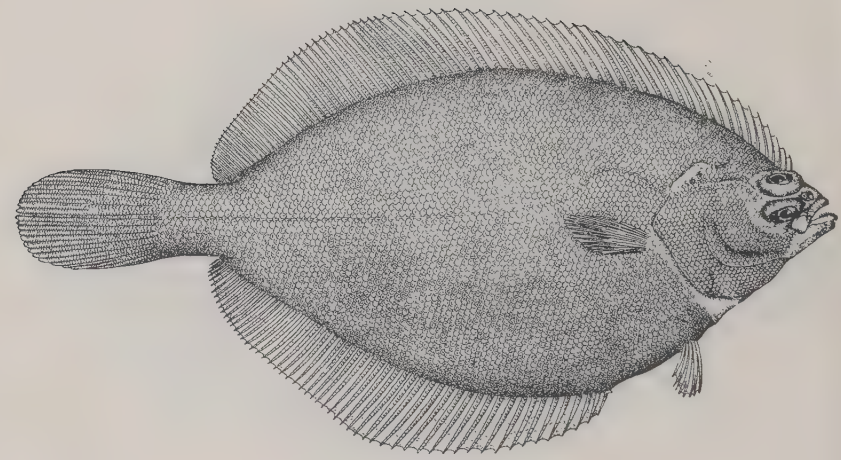
925. ANCYLOPSETTA QUADROCELLATA. (P. 2634.)
926. PLEURONICHTHYS DECURRENS. (P. 2637.)



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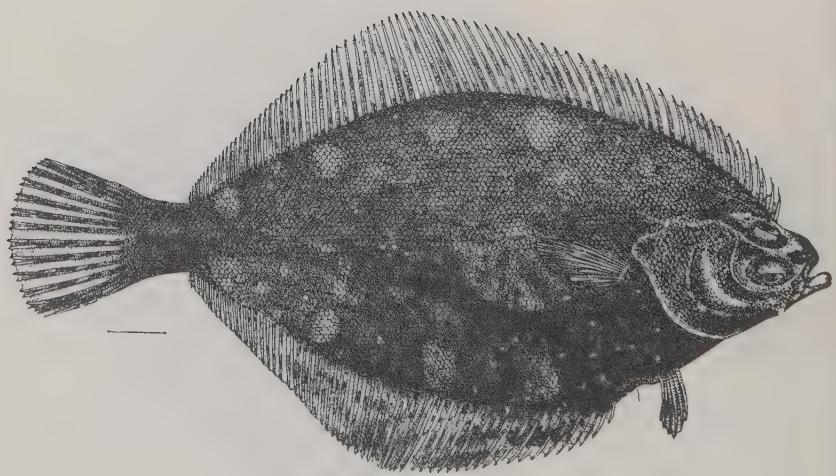

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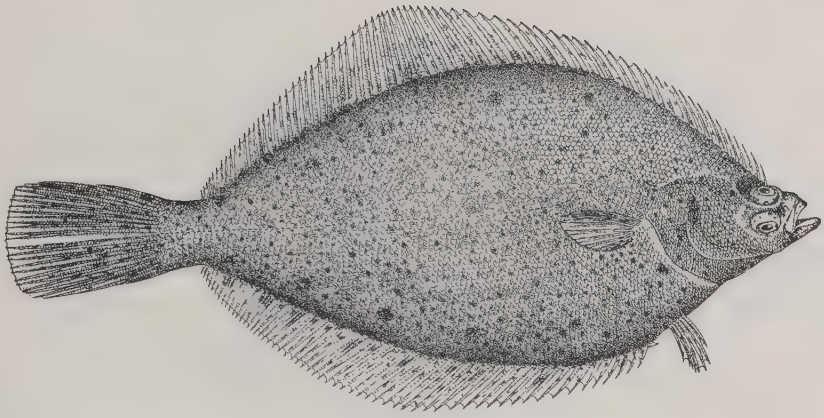
927. INOPSETTA ISCHYRA. (P. 2641.)
928. LEPIDOPSETTA BILINEATA. (P. 2643.)



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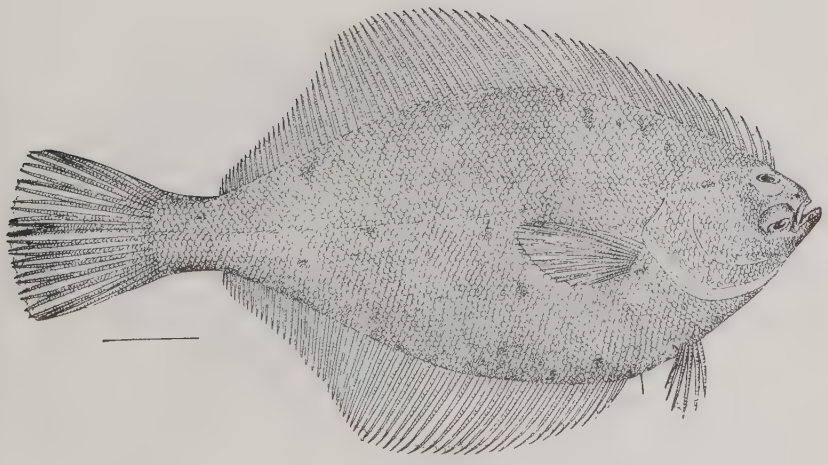
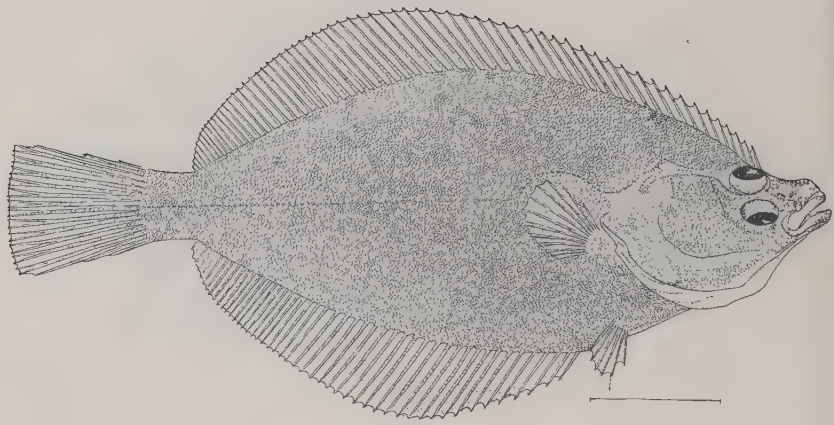


930

929. LIMANDA FERRUGINEA. (P. 2644.)
930. LIMANDA ASPERA. (P. 2645.)



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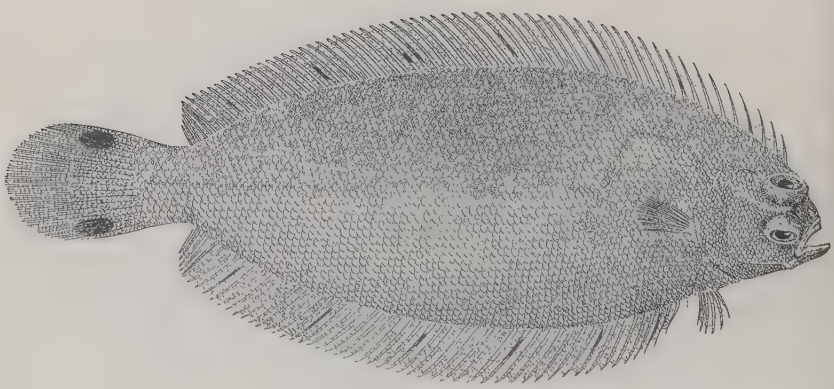

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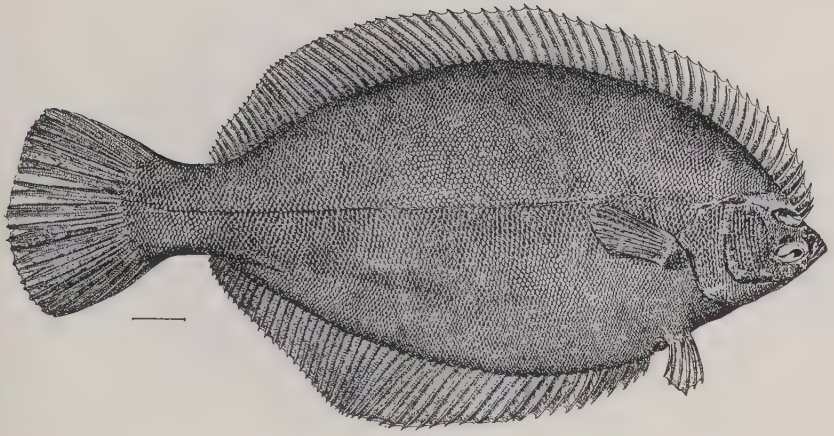
931. LIMANDA PROBOSCIDEA. (P. 2645.)
932. LIMANDA BEANII. (P. 2646.)



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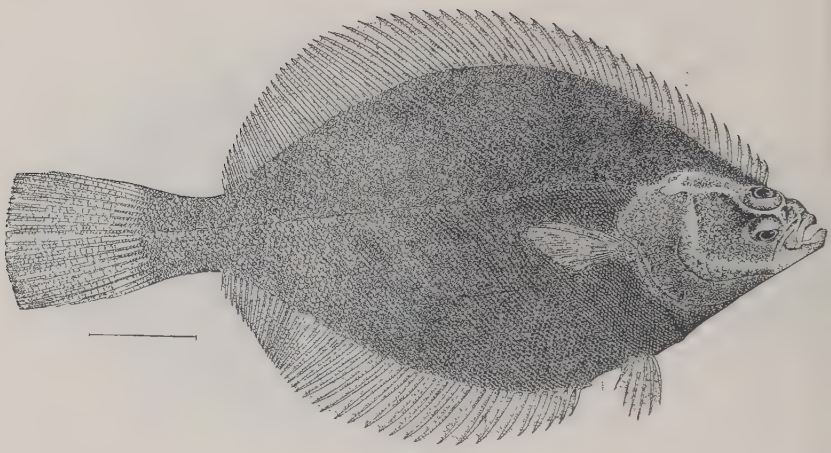
934

933. PSEUDOPLEURONECTES AMERICANUS. (P. 2647.)
934. PLEURONECTES QUADRITUBERCULATUS. (P. 2648.)



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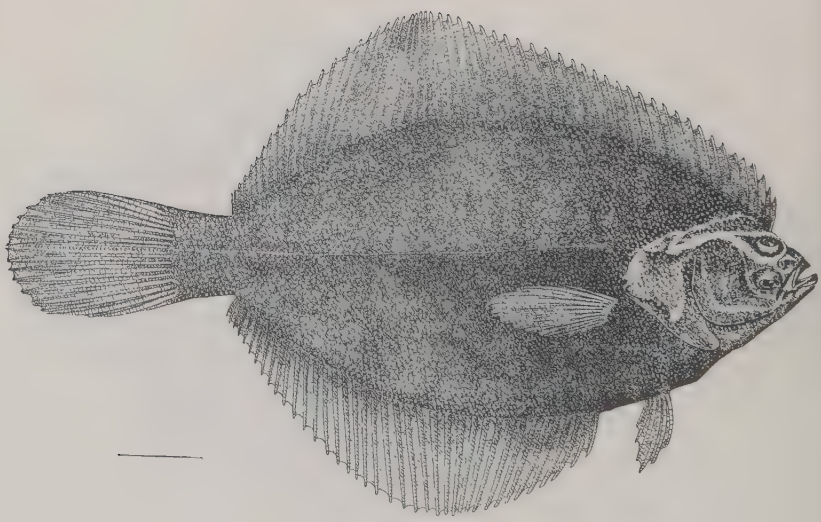

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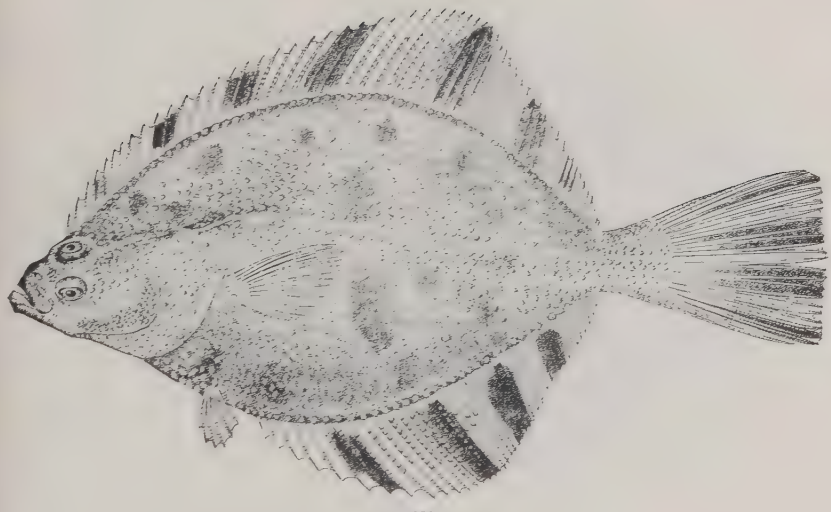
935. LIOPSETTA GLACIALIS. (P. 2649.)
936. LIOPSETTA PUTNAMI. (P. 2650.)



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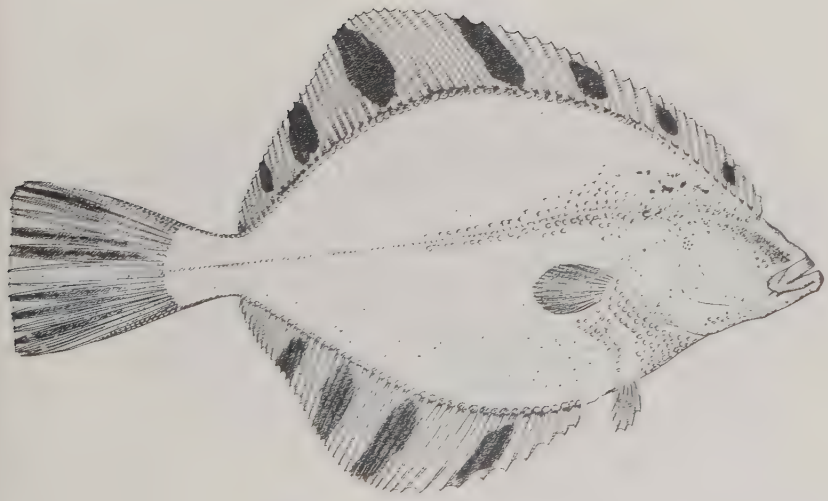
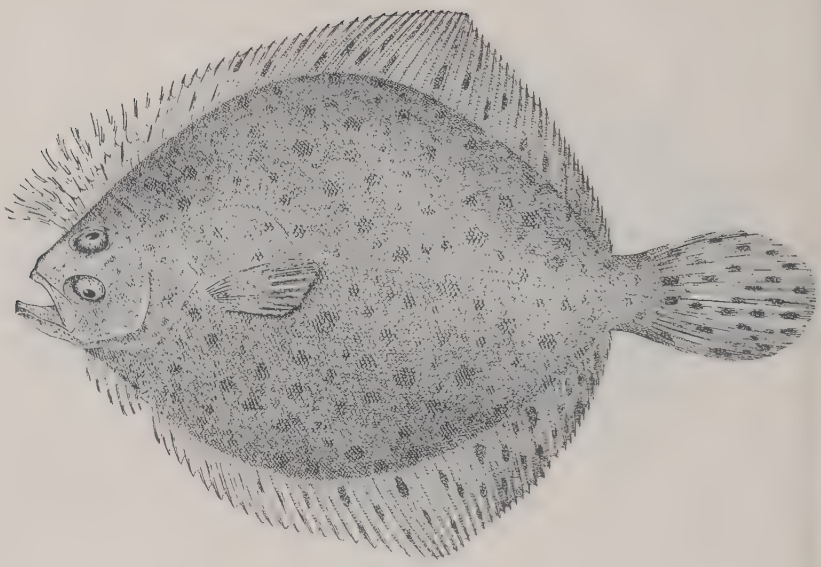


937*a*

937, 937*a*. PLATICHTHYS STELLATUS. (P. 2652.)



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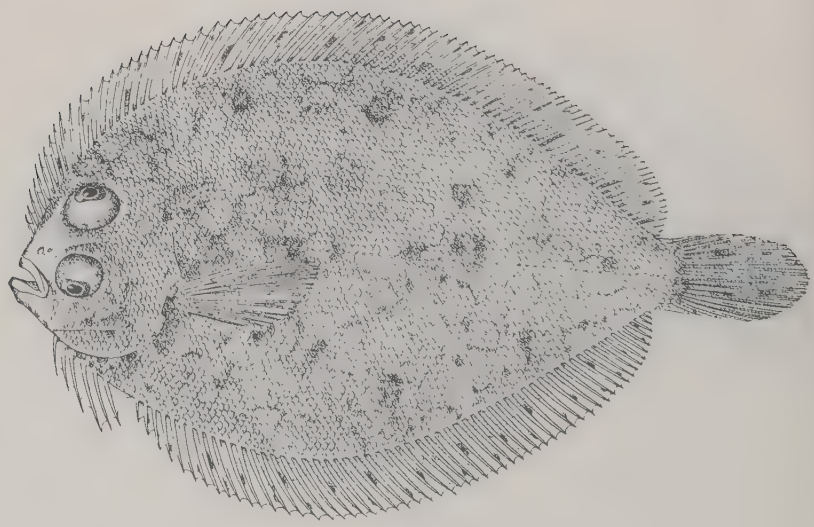

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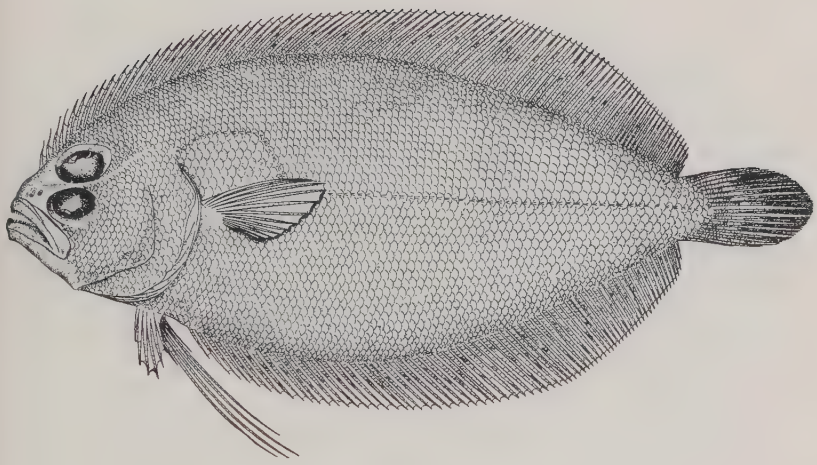
938. LOPHOPSETTA MACULATA. (P. 2660.)
939. PLATOPHRYS OCELLATUS. (P. 2663.)



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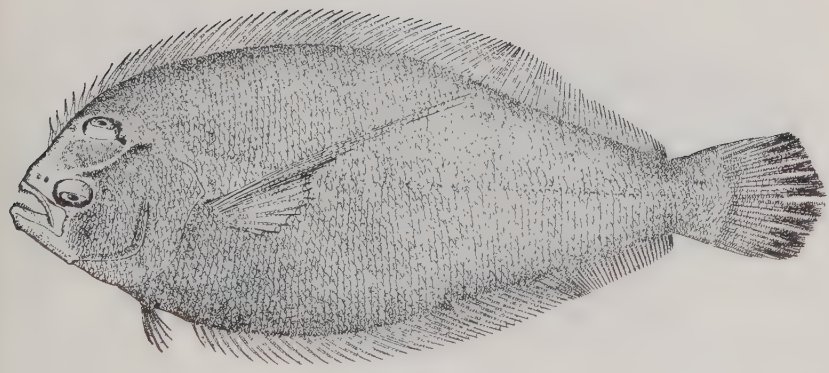

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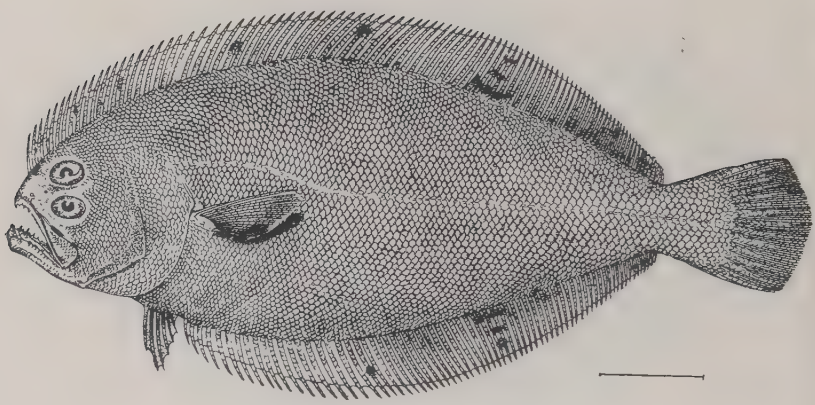
940. TRICHOPSETTA VENTRALIS. (P. 2669.)
941. SYACIUM PAPILLOSUM. (P. 2671.)



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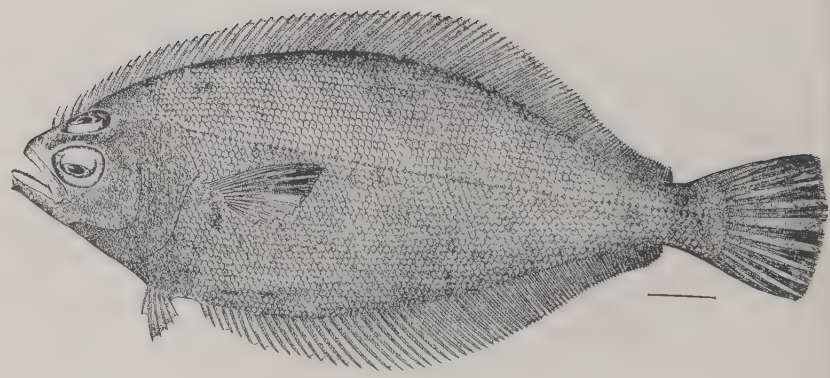

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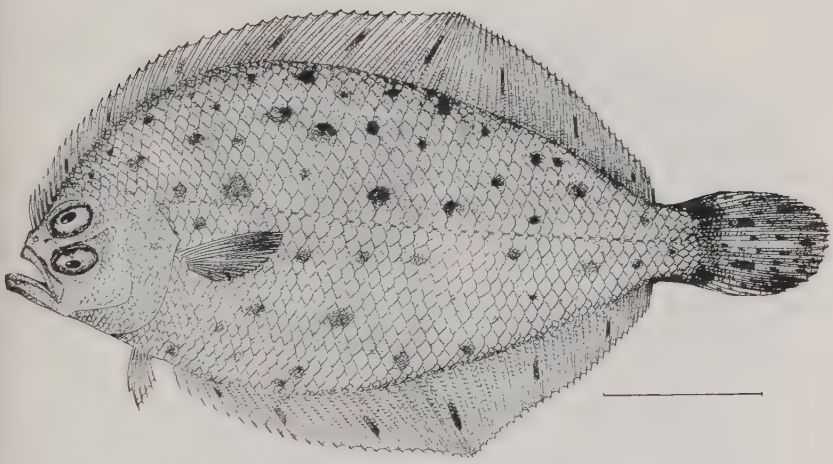
942. AZEVIA PANAMENSIS. (P. 2677.)
943. CITHARICHTHYS SORDIDUS (P. 2679.)



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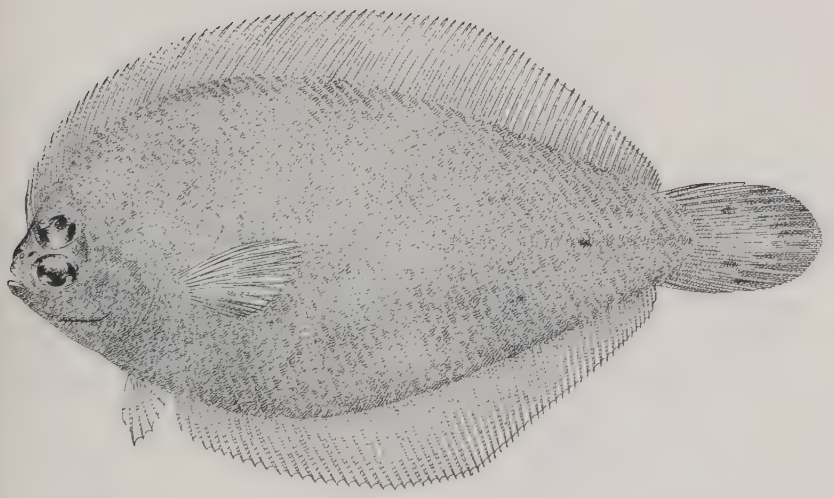

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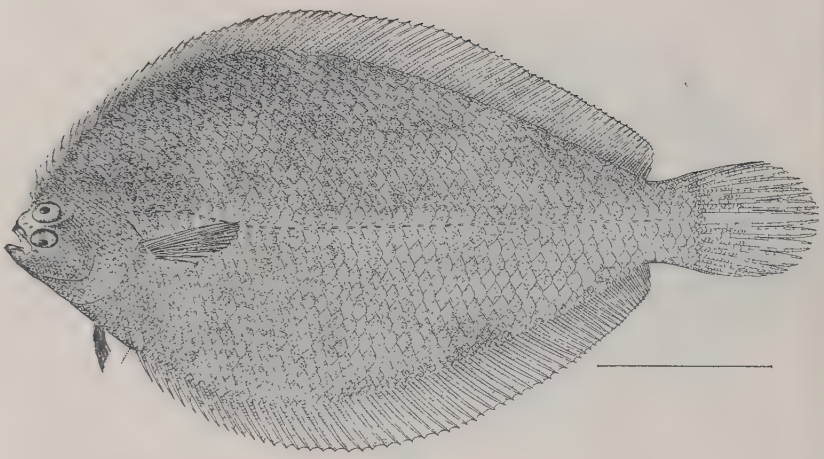
944. CITHARICHTHYS MACROPS. (P. 2684.)
945. ETROPUS RIMOSUS. (P. 2688.)



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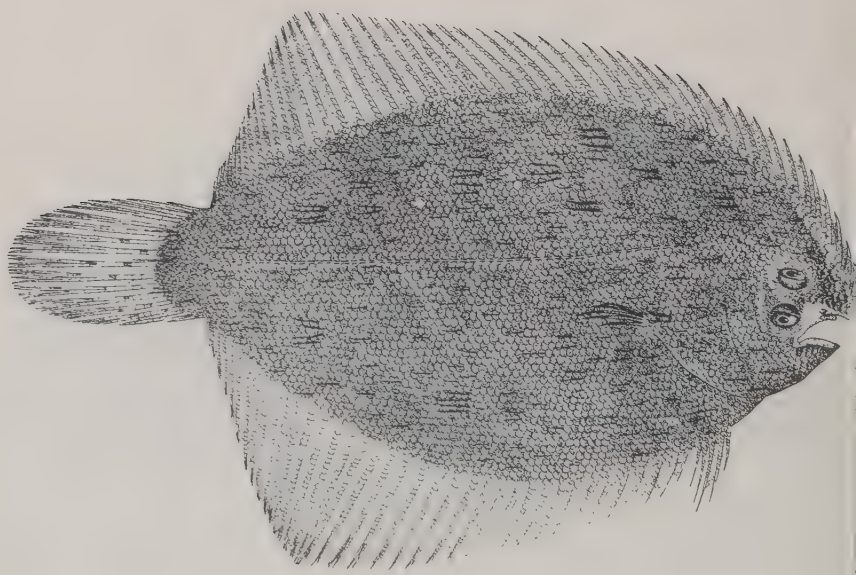

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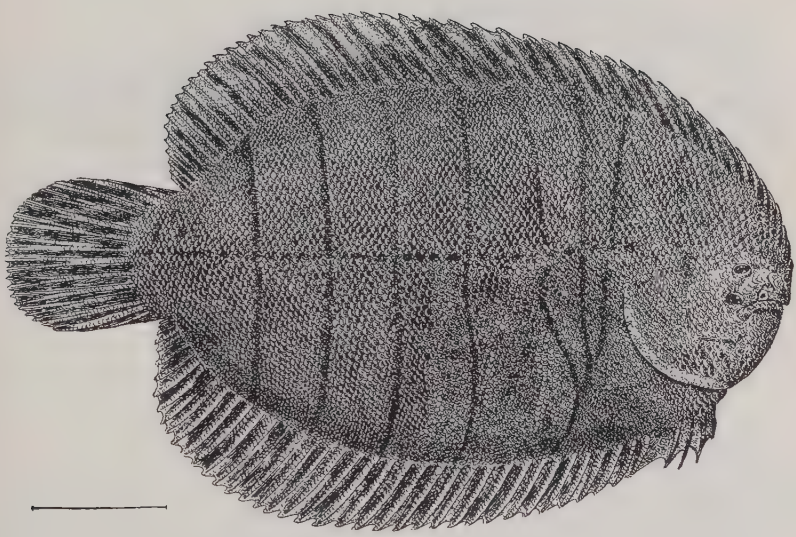
946. ETROPUS CROSSOTUS. (P. 2689.)
947. ACHIRUS LINEATUS. (P. 2697.)



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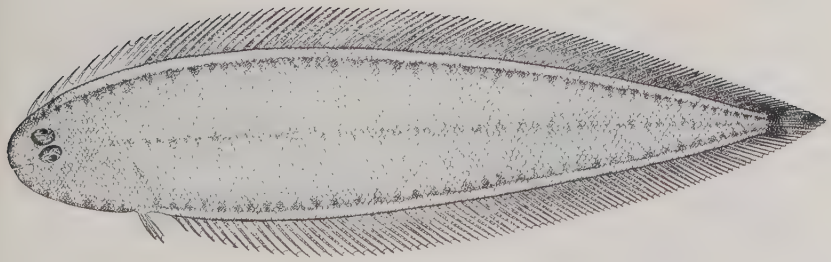
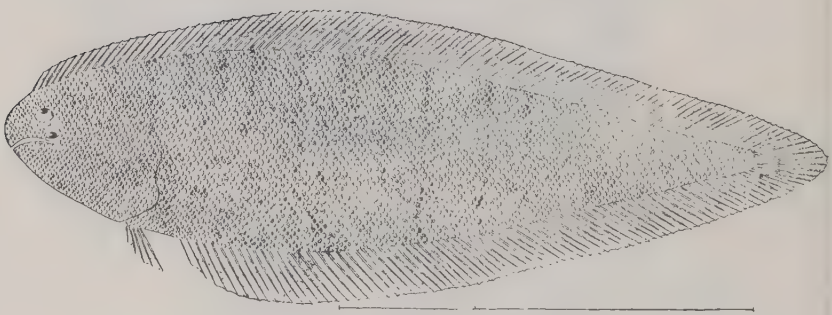


949

948. Achirus fasciatus. (P. 2700.)
949. Symphurus marginatus. (P. 2706.)

950

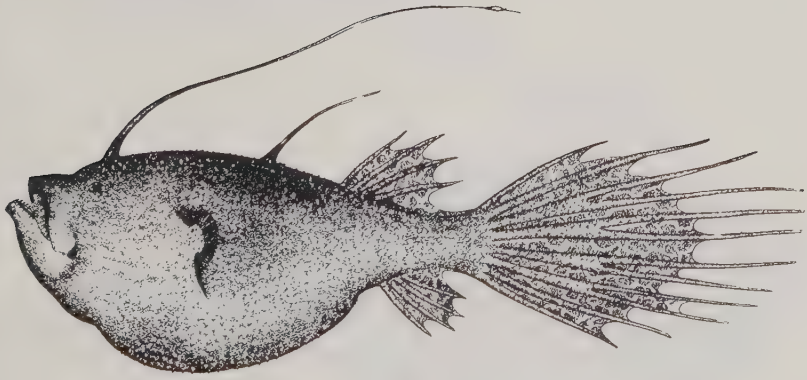


951

952

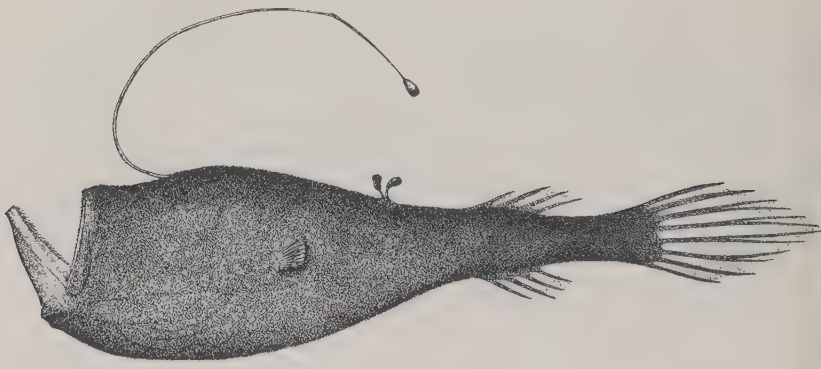
950. SYMPHURUS PLAGIUSA. (P. 2710.)
951. SYMPHURUS WILLIAMSI. (P. 2711.)
952. LOPHIUS PISCATORIUS. (P. 2713.)

953



954

953. Chaunax pictus. (P. 2726.)
954. Ceratias holbolli. (P. 2729.)



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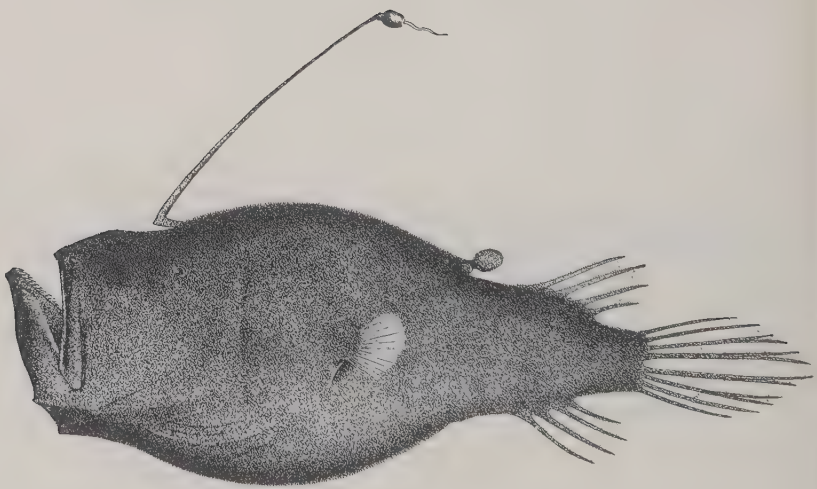
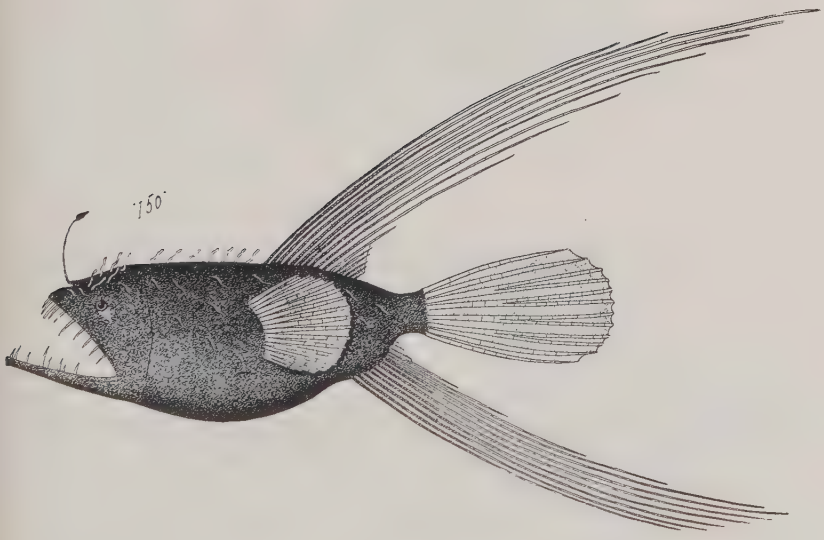


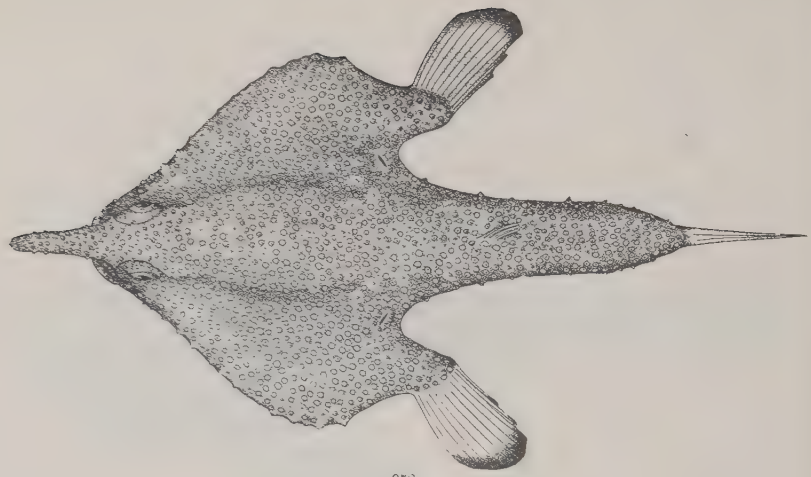
956

955. MANCALIAS SHUFELDTI. (P. 2730.)
956. CRYPTOPSARAS COUESII. (P. 2731.)



957

957. Caulophryne jordani. (P. 2735.)



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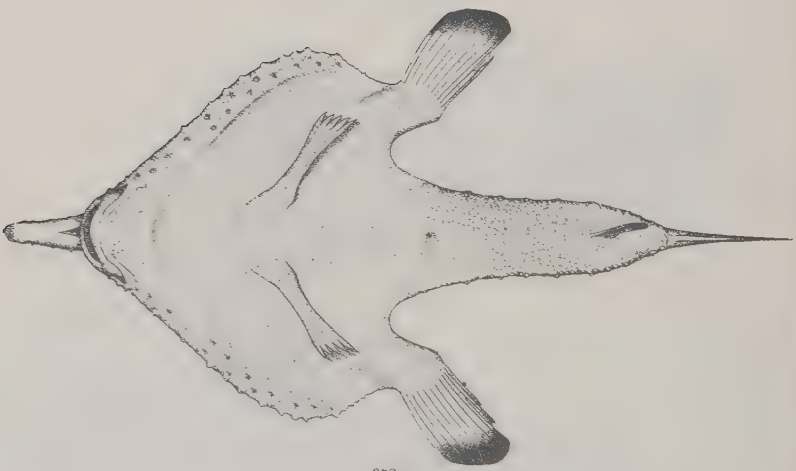

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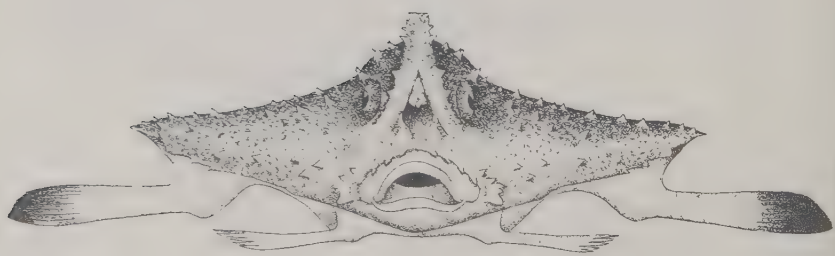

958*b*

958, 958*a*, 958*b*. OGCOCEPHALUS VESPERTILIO. (P. 2737.)

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